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Status of Atlantic Salmon (*Salmo salar* L.) Stocks of Insular Newfoundland (SFAs 3-14A), 1999

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Abstract

The commercial Atlantic salmon fishery moratorium, implemented in insular Newfoundland in 1992, entered its eighth year in 1999. On the northeast and east coasts of insular Newfoundland (SFAs 4 and 5), total returns of small salmon in 1999 increased slightly over or were similar to those of 1998 in four out of seven monitored rivers; one river showed an increase over the 1992-98 mean, three were similar, and two decreased. On the south coast (SFAs 9-11), total returns of small salmon increased or were similar to those of 1998 in two rivers and decreased in three; two rivers increased, one remained the same, and two decreased in relation to the 1992-98 mean. Total returns of small salmon to rivers in SFA 13 (including those in Bay St. George) in 1999 showed a marked improvement over recent years. Total returns of small salmon decreased from 1998 in two out of three monitored rivers in SFA 14A; two rivers showed increases over the 1992-98 means while the other had a slight decrease. Returns of large salmon and proportions of large salmon in total returns to most rivers in 1999 exceeded or were similar to the means for 1992-98 and several rivers had the highest or among the highest levels on record. Smolt-to-adult survival remained low overall in 1999. Smolt production decreased from that of 1998 at all counting facilities (ranging from 5 to 29%) except one, which increased by 60%. Unless there is an improvement in marine survival rates, it is expected that numbers of small salmon returning to insular Newfoundland rivers in year 2000, in general, will be lower than in 1999.

Résumé

Le moratoire sur la pêche commerciale du saumon atlantique, qui est entré en vigueur à l'île de Terre-Neuve en 1992, commençait sa huitième année en 1999. Sur les côtes nord-est et est de Terre-Neuve (ZPS 4 et 5), dans quatre des sept rivières surveillées, les remontes totales de petits saumons en 1999 ont été soit légèrement supérieures, soit semblables à celles de 1998; par rapport à la moyenne des années 1992-1998, les remontes ont été supérieures dans une rivière, semblables dans trois et inférieures dans les deux autres. Sur la côte sud (ZPS 9-11), les remontes totales de petits saumons ont soit augmenté ou étaient semblables à celles de 1998 dans deux rivières et ont diminué dans trois; deux rivières ont augmenté, une est demeuré semblable, et deux ont diminué par rapport à la moyenne des années 1992-1998. Les remontes totales de saumons vers les rivières dans le ZPS 13 (comprenant celles de la baie St-Georges) se sont nettement améliorées au cours des dernières années. Les remontes totales de petits saumons ont diminué en 1998 dans deux des trois rivières surveillées du ZPS 14A; dans deux rivières, les remontes ont été supérieures à la moyenne de 1992-1998 tandis que dans la troisième, elles ont été légèrement inférieures à cette moyenne. En 1999, dans la plupart des rivières, les remontes de gros saumons et la proportion de gros saumons dans les remontes totales ont été semblables ou supérieures aux moyennes de 1992-1998 et elles ont atteint des niveaux records ou parmi les plus élevés dans plusieurs rivières. Le taux de survie des saumons entre le stade de saumoneau et celui de la remonte des adultes est demeuré généralement faible en 1999. La production de saumoneaux a diminué (de 5 à 29 %) par rapport à celle de 1998 dans toutes les installations de comptage sauf une, où elle a augmenté de 60 %. À moins d'une amélioration du taux de survie en mer, il faut s'attendre à ce que le nombre de petits saumons qui remonteront les rivières de Terre-Neuve au cours de l'an 2000 soit généralement inférieur à celui de 1999.

Introduction

This paper presents the general status of Atlantic salmon stocks in Salmon Fishing Areas (SFAs) 3-14A of the Newfoundland Region (Fig. 1) in 1999. Catch and effort data from the recreational fishery and counts at fishways and counting fences are examined in relation to historical data and management measures in effect in 1999.

Management measures, past and present

The moratorium on the commercial Atlantic salmon fishery in insular Newfoundland continued in 1999. The implementation of the moratorium in 1992 was accompanied by a commercial license retirement program and followed a major management plan introduced in 1984 (O'Connell *et al.* 1992a; May 1993; Mullins and Caines MS 1994), elements of which were continued into the quota years of 1990 and 1991 (O'Connell *et al.* MS 1992b) and the moratorium years. These regulations continue a long-standing history of management programs designed to prevent stock declines and to allow populations to rebuild (May 1993).

The moratorium placed on the Northern Cod Fishery in 1992, which should have eliminated by-catch of Atlantic salmon in cod fishing gear in SFAs 1-9, was interrupted in 1999 with a limited commercial fishery (total allowable catch of 9000 t) (Anon. 1999a). There was a small inshore index cod fishery in this area in September-October in 1998, which is mainly outside the migration period of June-early September for most Atlantic salmon destined for insular Newfoundland rivers. A moratorium was placed on cod fishing in SFAs 10-14A in August 1993. In 1997, the cod fishery in SFAs 10 and 11 opened for the first time since 1993 with a TAC of 10,000 t; the quota was increased to 20,000 t in 1998 and to 30000 t in 1999. This fishery opened in April/May and continued through the summer into autumn and winter. There were limited cod fisheries in NAFO areas 4RS and 3PN (which includes SFAs 12-14A) from June through autumn in 1998 and 1999. Collectively, these cod fisheries were prosecuted mainly with fixed gear (gillnets), hand line, and long line and did not involve the use of cod traps, which traditionally accounted for the major portion of Atlantic salmon by-catch.

A quota on the number of small salmon (< 63 cm in fork length) that could be retained in the Atlantic salmon recreational fishery was introduced in each SFA in 1992 and 1993. The quota was assigned for each SFA as a whole as opposed to individual river quotas. Only hook-and-release fishing was permitted after the quota was caught in each SFA. Quotas were eliminated in 1994. The seasonal bag limit for the retention of small salmon was lowered from eight to six fish in 1994, three to be caught prior to July 31 and three after that date. Hook-and-release fishing only was permitted after the bag limit of three was reached in each time period. These measures remained in effect in 1995-97. Returns of small salmon to many rivers in insular Newfoundland in 1997 were substantially lower than expected (Dempson *et al.* MS 1998; O'Connell *et al.* (MS 1998a). As a result of this and uncertainties regarding levels of future returns, the management plan for 1998 was much more conservative than for previous years. The seasonal bag limit for the retention of small salmon in insular Newfoundland was reduced to one, pending the results of an in-season review. As a result of the findings of the in-season review, anglers were allowed to additionally retain three small salmon from July 4 until the end of the angling season. Beginning on July 8, 1998 only the use of barbless hooks was

permitted. As in previous years, the retention of large salmon (≥ 63 cm in fork length) was not permitted in insular Newfoundland in 1999.

A three-year management plan was implemented in 1999, a significant component of which was the introduction of a River Classification System for insular Newfoundland, used to develop retention levels based on the health of individual stocks, without jeopardising conservation goals. This was a major departure from previous years when stocks were managed on a more regional or SFA basis. Details of the three-year plan and a description of the River Classification System are provided in Anon. (1999b).

Special management measures were in effect for several rivers in 1999 and a number of rivers were closed for the season, details of which are provided in Anon. (1999c). More details on openings and closures throughout the season on a river-specific basis, including times when rivers were closed due to high water temperatures and low water levels, are presented in Table 1.

As was the case for the period 1995-97, there were fall hook-and-release fisheries (September 8-October 7) in Gander River (SFA 4) and in Humber River (SFA 13) in 1999.

For the five-year period immediately preceding the commercial salmon fishery moratorium, the average number of recreational fishery licenses sold in Newfoundland and Labrador was 24493. Maximum license sales prior to the moratorium were recorded in 1988 (26445). By comparison, sales during the moratorium years were 25718 (1992), 26508 (1993), 22596 (1994), 21489 (1995), 25553 (1996), 21175 (1997), 17949 (1998), and 16026 (preliminary) in 1999.

Methods

Recreational fishery catch and effort data and fishway and counting fence data were added to that presented in O'Connell *et al.* (MS 1999). Prior to 1997, recreational fishery data were compiled as described by Ash and O'Connell (1987a,b) and Mullins and Claytor (1989). Catch statistics for both retained and released small salmon were used in 1992-99. There was no estimate of released fish during the period of retention of catch in 1992, which could impact on comparisons. Catches of small salmon for all years prior to 1992 are retained catches only. Information for released large salmon has been available since 1985 for SFAs 12 and 13. Recreational fishing effort was presented as rod days, defined as any day or part of a day on which an angler fishes.

Angling data were provided by Department of Fisheries and Oceans (DFO) River Guardians for all of insular Newfoundland and Labrador prior to 1997. Angling data for insular Newfoundland in 1997-99 were derived from the License Stub Return System (see O'Connell *et al.* (MS 1998b) for a description of the methodology). The information for 1999 is preliminary at this stage. The License Stub Return System for collecting recreational fishery data represents a complete departure from the previous DFO River Guardian method. Details of a comparison of stub data with DFO River Guardian data, for rivers in insular Newfoundland for 1994-96, are

provided in O'Connell *et al.* (MS 1998b). Overall, estimates of released small and large salmon from the stub were substantially higher than estimates from River Guardians, while the two methods were closer with respect to estimates of small salmon retained. This has to be kept in mind when comparing catches in 1997-99 with previous years. There is evidence that effort expenditure was under-reported by the stub method and hence this information will not be used in the present document for 1997-99. Analyses are currently being carried out to adjust for under-reporting.

Recreational fishery catch and effort information and counts of salmon at counting facilities in 1999 were compared to two pre-salmon moratorium means (1984-89 and 1986-91). The 1984-89 mean corresponds to years under major management changes in the commercial fishery in the Newfoundland Region (O'Connell *et al.* 1992a). The commercial fishery in each SFA in insular Newfoundland in 1990 and 1991 was under quota control (O'Connell *et al.* MS 1992b). The 1986-91 mean incorporates the quota years of 1990 and 1991. The mix of management measures in effect during 1984-89 on the one hand and the imposition of commercial quotas in 1990 and 1991 on the other, should be kept in mind when making evaluations based on the 1986-91 mean. For all SFAs except 12-14A, the year 1987 was not included in the means because drought conditions resulted in the closure of most rivers to angling for the greater part of the season. During the moratorium years, recreational fishery data in 1999 for insular Newfoundland were compared to the mean for 1992-96 (1997 and 1998 data were derived from the License Stub System, as seen above, and hence were not included in means). Angling information (River Guardian data) for SFAs 12 and 13 were incomplete in 1996, hence data from the License Stub Return System were used for these SFAs, and the moratorium mean used for comparisons for all SFAs of insular Newfoundland combined was 1992-95. Counts of adult salmon during the moratorium were compared to the mean for 1992-98.

Total river returns of small and large salmon (which typically are counts at counting facilities plus angling removals below counting facilities plus an adjustment for hook-and-release mortality), in 1999, were assessed against mean returns for the moratorium period 1992-98. References for river-specific methodologies used for the calculation of total river returns of small and large can be found in CSAS (2000).

Means and 95% confidence intervals for ratios were calculated according to Cochran (1977).

Results and Discussion

Smolt-to-adult (small salmon) survival

The smolt-to-adult survival (repeat spawners included) of 6.1% for Campbellton River in 1999 (adult year) increased over that of 1998, in which year the second lowest value (5.3%) of the time series was recorded (Table 2); the highest survival for this river occurred in 1994 (9.0%). A survival of 5.5% was observed for Northeast Brook (Trepassey) (SFA 9), a slight improvement over that of 1998 (5.0%) but low compared to the record high of 1996 (9.2%).

Rocky River (SFA 9) recorded a survival of 2.7%, the second lowest of the time series. Conne River (SFA 11) had a survival of 3.4%, an improvement over the second lowest survival (2.9%) on record which occurred in 1998; highest survival for this river (10.2%) was reached in 1988. For Highlands River (SFA 13), survival in 1999 (2.5%) increased over the record low of 1.4% observed in 1998. Survival for Western Arm Brook (SFA 14A) in 1999 (6.1%) decreased from the 7.2% recorded in 1998.

Fig. 2 shows graphically the trends in sea survival for the rivers mentioned above. Survival adjusted for commercial exploitation (from Dempson *et al.* MS 1998) is also shown for Conne River, Northeast Brook (Trepassey), and Western Arm Brook. During the moratorium years, estimates of sea survival from smolts to adult small salmon are believed to represent natural survival rates. Pre-moratorium adjusted survival rates approaching 15% were achieved in Conne River and Northeast Brook, Trepassey. Ocean survival for both of these stocks fell throughout the late 1980s and early 1990s. Despite major changes to fisheries and corresponding reductions in marine exploitation, sea survival rates remain low; adjusted sea survival rates serve to highlight the differences even more.

Recreational fishery and counts at counting facilities

Recreational catches of small and large salmon for insular Newfoundland (SFAs 3-14A combined) are presented in Appendix 1a. Data for insular Newfoundland were also rolled into four subdivisions, Northern Peninsula East and Eastern (SFAs 3-8), South (SFAs 9-11), Southwest (SFAs 12-13), and Northern Peninsula West (SFA 14A) and are shown in Appendix 1b-e. Data for each individual SFA are shown in Appendix 1f-q. Calculation of catch per unit of effort (CPUE) is in terms of small and large retained and released fish combined.

<u>Entire Insular Newfoundland (SFAs 3-14A)</u>

Recreational fishery

The total catch of small salmon in the recreational fishery in all of insular Newfoundland in 1999, decreased from 1998 and was below the 1992-96 mean (Fig. 3). The number of small salmon retained was the lowest in the time series.

<u>Northern Peninsula East and Eastern (SFAs 3-8)</u>

Recreational fishery

The total catch of small salmon in 1999 decreased from 1998 and was below the 1992-96 mean (Fig. 4). The number of small salmon retained decreased from 1998 and the 1984-89, 1986-91, and 1992-96 means and was among the lowest on record.

Counting facilities

SFA 3: A counting fence was operated for the fourth year in Northwest Branch tributary of Main River (Sop's Arm). Counts of small (Table 3) and large (Table 4) salmon in 1997-99 were partial.

SFA 4: Counts of small (Table 3) and large (Table 4) salmon are available for fishways located in the Exploits River (Bishop's Falls) and Salmon Brook tributary of Gander River and counting fences in Campbellton River and Gander River (main stem). Counts of small and large (highest on record) salmon for Exploits River in 1999 increased over 1998 and the 1984-89, 1986-91, and 1992-98 means. The count of small salmon in Campbellton River decreased slightly from 1998 and was similar to the 1992-98 mean; the count of large salmon (second highest on record) increased over 1998 and the 1992-98 mean. The count of small salmon at the Gander River counting fence was similar to that of 1998 and increased over the 1986-91 mean, but decreased slightly from the 1992-98 mean; the count of large salmon was the highest on record. The number of small salmon entering the Salmon Brook tributary of Gander River decreased from 1998, was similar to the 1984-89 and 1992-98 means, but increased over the 1986-91 mean; the count of large salmon in 1999 (second highest on record) was similar to that of 1998 and remained above the means.

SFA 5: Counts of small (Table 3) and large (Table 4) salmon are available from fishways in Middle Brook and Terra Nova River (upper and lower) and counting fences in Indian Bay Brook (since 1997) and Northwest River, Terra Nova National Park (since 1995). The count of small salmon in Indian Bay Brook in 1999 decreased from that of 1998, the year of the highest count; the count of large salmon increased slightly over 1998 and was the highest of the three years. The count of small salmon in Middle Brook decreased from 1998 but remained above the means; the count of large salmon decreased from 1998 and the 1992-98 mean but increased over the 1984-89 and 1986-91 means. At the lower Terra Nova River fishway, the count of small salmon was similar to 1998 and the 1992-98 mean and increased over the 1984-89 and 1986-91 means; the count of large salmon decreased from 1998 and the 1992-98 mean but remained above the 1984-89 and 1986-91 means. The counts of small and large salmon for the lower Terra Nova River in 1993 were incomplete due to fish bypassing the fishway. This was caused by the washout of the diversion dam above the fishway and unusually high water levels. However, since counts in 1993 were the highest ever recorded for small salmon (and highest up to that year for large salmon), they were included in the 1992-98 means. The count of small salmon at the upper Terra Nova River fishway in 1999 decreased from that of 1998 but increased over the means (only slightly in case of the 1992-98 mean); the count of large salmon decreased from 1998 and the 1992-98 mean but increased over the 1984-89 and 1986-91 means. Counts of small and large salmon in Northwest River in 1999 decreased from those of 1998 and were the lowest of the time series.

South (SFAs 9-11)

Recreational fishery

The total catch of small salmon in 1999 decreased from 1998 and was below the mean for 1992-96 (Fig. 5). The number of small salmon retained was the lowest of the time series.

Counting facilities

SFA 9: Counts of small (Table 3) and large (Table 4) salmon are available from a counting fence in Northeast Brook (Trepassey) and a fishway in Rocky River. The count of small salmon in Northeast Brook, Trepassey in 1999 was similar to 1998 and the 1984-89 and 1986-91 means but increased over the 1992-98 mean; the count of large salmon increased over 1998 and the 1992-98 mean but decreased from the 1984-89 and 1986-91 means. The count of small salmon in Rocky River decreased from 1998, increased over the 1984-89 and 1986-91 means, and was the same as the mean for 1992-98; the count of large salmon decreased from 1998 but remained above the means.

SFA 10: Counts of small (Table 3) and large (Table 4) salmon are provided by a fishway located in Northeast River (Placentia). The count of small salmon in 1999 was the lowest of the moratorium years; the count of large salmon decreased from 1998 (highest on record) but remained above the means.

SFA 11: Counts of small (Table 3) and large (Table 4) salmon are available from counting fences in Conne River and Little River. The count of small salmon for Conne River in 1999 decreased from 1998 and the means; the count of large salmon decreased from 1998 and the 1984-89 and 1986-91 means but remained above the 1992-98 mean. The count of small salmon for Little River increased over 1998 and the means; the count of large salmon was the same as for 1998 and was above the means (slightly in the case of the 1992-98 mean).

Southwest (SFAs 12-13)

Recreational fishery

The total catch of small salmon in 1999 decreased from 1998 and the 1992-96 mean (Fig. 6). The number of small salmon retained increased over 1998 (lowest on record) and remained below the means. The number of large salmon released decreased from 1998, but remained above the means.

Counting facilities

SFA 13: Counts of small (Table 3) and large (Table 4) salmon are available from counting fences in Highlands River and Pinchgut Brook and population estimates derived from mark-recapture studies are available for Humber River (Mullins and Caines MS 2000). The count of small salmon in Highlands River in 1999 increased over 1998 but was below the 1992-98 mean; the count of large salmon decreased from 1998 and the mean. The count of small

salmon in Pinchgut Brook was similar to 1998 and increased slightly over the 1992-98 mean; the count of large salmon was the same as for 1998 and increased over the 1992-98 mean. The estimated population size of small salmon for Humber River in 1999 increased over 1998 and the 1992-98 mean; the estimate for large salmon decreased slightly from the record high in 1998 and remained above the mean.

Northern Peninsula West (SFA 14A)

Recreational fishery

The total catch of small salmon in 1999 decreased from 1998 and the 1992-96 mean (Fig. 7). The number of small salmon retained was the lowest on record. The number of large salmon released increased over 1998 and the means.

Counting facilities

Counts of small (Table 3) and large (Table 4) salmon are available from fishways located in Lomond River and Torrent River and a counting fence in Western Arm Brook. The count of small salmon in Lomond River in 1999 increased over 1998 and the means; the count of large salmon decreased from the record high in 1998 and remained above the means. Counts of small and large salmon for Torrent River decreased from 1998 and the 1992-98 means but increased over the 1984-89 and 1986-91 means. The count of small salmon for Western Arm Brook in 1999 decreased from 1998 but increased over the means; the count of large salmon decreased from 1998 and the 1992-98 mean but was well above the 1984-89 and 1986-91 means.

Total returns

Total returns of small and large salmon to rivers in insular Newfoundland are presented in Tables 5 and 6. The information contained in Tables 5 and 6 is also presented graphically below. Since the closure of the commercial salmon fishery in 1992, returns of small and large salmon to rivers are assumed to be total population sizes.

Northern Peninsula East and Eastern (SFAs 3-8)

SFA 4

Total returns of small salmon to Exploits River in 1999 (Fig. 8) increased slightly over 1998 and remained well above the means (Table 7). Returns to Campbellton River were slightly below 1998 but similar to the mean, while for Gander River, returns were similar to 1998, slightly below the 1992-98 mean, but well above the mean for 1986-91.

Total returns of large salmon to Exploits, Campbellton, and Gander rivers in 1999 (Fig. 9) increased over 1998 and the means (Table 8), with returns to Gander and Exploits rivers being the highest on record and to Campbellton River the second highest.

The proportion of large salmon in total returns in 1999 was the highest of the moratorium years for Exploits River and Gander River and the second highest for Campbellton River (Table 9 and Fig. 10).

SFA 5

Total returns of small salmon in 1999 (Fig. 11) decreased from 1998 in Indian Bay Brook (Table 7). Returns to Middle Brook decreased from 1998 but increased over the means (slightly in the case of the 1992-98 mean). For Terra Nova River there were increases over 1998 (slight) and the 1984-89 and 1986-91 means and a decrease from the 1992-98 mean. Returns to Northwest River decreased from 1998 and the 1992-98 mean.

Total returns of large salmon in 1999 (Fig. 12) for Indian Bay Brook increased over 1998 (Table 8). Returns to Middle Brook and Terra Nova River decreased from 1998 and the 1992-98 mean but increased over the 1984-89 and 1986-91 means. Returns to Northwest River decreased from 1998 and the 1992-98 mean.

The proportion of large salmon in total returns (Table 9 and Fig. 13) for Indian Bay Brook in 1999 was the second highest to date. Proportions for Middle Brook and Terra Nova River decreased from 1998 and the 1992-98 mean but remained above the means for 1984-89 and 1986-91. The proportion for Northwest River increased over 1998 and was similar to the mean for 1992-98.

South (SFAs 9-11)

SFA 9

Since there was no angling in Northeast Brook (Trepassey) and Rocky River, total returns of small and large salmon are equivalent to the counts at the counting facilities and these were dealt with previously. Counts for small and large salmon are shown graphically in Figs. 14 and 15.

The proportion of large salmon in total returns to Northeast Brook (Trepassey) in 1999 (Table 9 and Fig. 16) increased over 1998 and the 1992-98 mean but remained below the 1984-89 and 1986-91 means. The proportion for Rocky River decreased from 1998 but increased over the means.

SFA 10

Total returns of small salmon to Northeast River (Placentia) in 1999 (Fig. 17) decreased from 1998 and were the lowest of the moratorium years (Table 7).

Total returns of large salmon to Northeast River (Placentia) in 1999 (Fig. 18) decreased from 1998 (highest on record) but remained above the means (Table 8).

The proportion of large salmon in total returns to Northeast River (Placentia) in 1999 (Table 9 and Fig. 19) was the highest on record.

SFA 11

Total returns of small and large salmon to Little River and Conne River in 1999 (Figs. 20 and 21) were equivalent to the counts at the counting fences (these rivers were closed to angling) and were dealt with previously.

The proportion of large salmon in total returns to Little River in 1999 decreased from 1998 and the 1992-98 mean but increased over the 1996-91 mean (Table 9 and Fig. 22). The proportion for Conne River was similar to 1998 but higher than the means for 1986-91 and 1992-98.

Southwest (SFAs 12-13)

SFA 13

Total returns of small (Fig. 23) and large (Fig. 24) salmon to Highlands River and Pinchgut Brook are equivalent to the counts at the counting fences (no angling in Highlands and the result of the method of calculation of total returns for Pinchgut) and to the mark-recapture estimates for Humber River, all of which were dealt with previously.

The proportions of large salmon in total returns for Highlands and Humber rivers in 1999 decreased from 1998 while that of Pinchgut Brook was similar to 1998 (Table 9 and Fig. 25). The proportion for Highlands River decreased from the 1992-98 mean while Humber River and Pinchgut Brook recorded increases.

Northern Peninsula West (SFA 14A)

Total returns of small salmon to Lomond River in 1999 (Fig. 26) increased over 1998 and the means (slightly in the case of the 1992-98 mean) (Table 8). Returns to Torrent River decreased from 1998 and the 1992-98 mean but increased over the 1984-89 and 1986-91 means. Total returns to Western Arm Brook are equivalent to counts at the counting fence (no angling in this system) and have been dealt with previously.

Total returns of large salmon in 1999 (Table 8 and Fig. 27) decreased slightly from 1998 in Lomond River but remained above the means. Returns to Torrent River decreased from 1998 and the 1992-98 mean but were higher than the 1984-89 and 1986-91 means. Total returns to Western Arm Brook are equivalent to counts at the counting fence (no angling in this system) and have been dealt with previously.

The proportion of large salmon in total returns for Lomond River in 1999 (Table 9 and Fig. 28) decreased from 1998 but was higher than the means. The proportion for Torrent River decreased from 1998, was similar to the mean for 1992-98, but remained higher than the means

for 1984-89 and 1986-91. The proportion for Western Arm Brook decreased from 1998 and the 1992-98 mean but increased over the means for 1984-89 and 1986-91.

Net marks

The incidence of net-marked fish has been determined for a number of rivers throughout insular Newfoundland since 1994. The results for small and large salmon combined are presented below:

River	1994	1995	1996	1997	1998	1999
Gander River	15.9	8.9	12.2	15.9	2.9	5.2
Campbellton River	6.2	5.0	4.3	4.3	5.6	4.1
Middle Brook				15.8	11.6	4.5
Terra Nova River				2.9	1.2	3.1
Conne River	18.6	7.1	6.2	7.2	3.7	4.0
Harry's River			0.6	9.3	1.8	0.2
Humber River		1.4	2.6	7.6	4.1	2.4

The incidence of net marks in 1999 increased over 1998 in Gander River, Terra Nova River, and Conne River and decreased in Campbellton River, Middle Brook, Harry's River, and Humber River. The most notable change occurred in Middle Brook. Net marks were likely the result of encounters with both legally set gear for other species and illegal gear in the marine environment and with illegal gear in freshwater. It is not possible to estimate the extent of such removals, therefore, total returns considered in the context of being equivalent to total production during the moratorium, have to be regarded as minimum values.

Comments and Conclusions

Returns of small salmon to monitored rivers on the northeast and east coasts in 1999 increased slightly over or were similar to those of 1998 in four cases and decreased in the remaining three. However, except for Terra Nova River and Northwest River, the marked improvements over the low returns of 1997 recorded in 1998, were maintained in 1999. For detailed analyses examining possible reasons for the overall low returns of small salmon in 1997, see Dempson *et al.* (MS 1998) and O'Connell *et al.* (MS 1998a). Rivers in Bay St. George (located in SFA 13) on the other hand, had returns of small salmon that were higher than expected in 1997 (O'Connell *et al.* MS 1998a; Porter and Bourgeois MS 1998). Most rivers in this area (Porter MS 2000) and others in SFA 13 showed marked improvements in 1999 over recent years. In spite of greatly increased spawning escapements beginning with the moratorium in 1992 (Table 10), returns of small salmon to most rivers on the northwest, northeast, and east coasts in 1999 remained similar to or increased moderately over the mean for 1992-98. Returns of small salmon in recent years to Northeast Brook (Trepassey) and Conne

River, both south coast rivers, were lower than the average for the five years prior to the moratorium.

Management changes in the recreational fishery, specifically the implementation and changing of quotas in SFAs along with mandatory hook-and-release fishing, and changing daily and seasonal bag limits, have seriously compromised the usefulness of angling data in terms of comparability with the past, especially when used as indices of abundance. Also, there have been variable and prolonged closures of rivers to angling over the years due to low water levels and high water temperatures. Added to this are the confounding elements associated with the derivation of 1997-99 angling data from the License Stub Return System. In the interpretation of trends and drawing of conclusions with respect to abundance, more weight is placed on information obtained from counting facilities than on recreational fishery data.

In spite of increased returns of small salmon in insular Newfoundland in 1998 and 1999 relative to 1997, angling catches overall in 1999, particularly the numbers of small salmon retained, were the lowest of the time series (Fig. 7). This could be due in part to the early onset of low water levels and high water temperatures in 1999 compared to previous years (e.g., see O'Connell *et al.* MS 2000a,b). The percentage of potential fishing days closed to angling in 1999 was high (Dempson *et al.* 2000). Low catches could also be reflective of the comparatively low number of anglers participating in the fishery in 1999; the number of licenses sold in 1999 continued the marked decline that started in 1998.

Smolt production in 1999 decreased from 1998 at all counting facilities (ranging from 5 to 29%) except Highlands River, which showed a 60% increase (Table 2). Unless there is an improvement in marine survival rates, it is expected that numbers of small salmon returning to insular Newfoundland rivers in year 2000, in general, will be lower than in 1999.

Returns of large salmon and proportions of large salmon in total returns to most rivers in 1999 exceeded or were similar to the means for 1992-98 and several rivers marked the highest or among the highest levels on record.

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Table 1. Opening and closure dates of the Atlantic salmon recreational fishery for each SFA, and variations by river, 1999.

Variations: River	Close dates	Reason for closure
SFA 1 June 15 - September 15		
SFA 2 June 15 - September 15		
Shinney's River	July 15 - August 11	Low water levels & high water temperatures
SFA 3 June 15 - September 7		
Soufletts River	July 23 - August 16	Low water levels & high water temperatures
Little Harbour Deep River	July 23 - August 16	"
Coney Arm River	July 23 - August 16	"
Main River (Sop's Arm)-Main stem	July 23 - August 13	"
-upper tributaries	July 23 -26	"
-lower tributaries	July 23 - August 16	"
main stem and tributaries above Krugar bridge	August 5 - September 7	"
Hampden River	July 23 - August 16	"
Wild Cove Brook	July 23 - August 16	"
Western Arm Brook	July 23 - August 16	"
Middle Arm Brook	July 23 - August 16	"
Southern Arm Brook	July 23 - August 16	"
Baie Verte River	July 23 - August 16	"
Woodstock Brook	July 23 - August 16	"
SFA 4 June 15 - September 7		
Burlington River	July 23 - August 16	Low water levels & high water temperatures
Indian River (Black Brook)	July 23 - August 16	"
West River	July 23 - August 16	"
South Brook	July 23 - August 16	"
Tommy's Arm River	July 23 - August 16	"
Northwest Arm Brook	July 23 - August 16	"
Western Arm Brook	July 23 - August 16	"
Leamington River	July 23 - August 16	"
Charles Brook	July 23 - August 16	"
Northern Arm River	July 23 - August 16	"
Peters River	July 23 - August 16	"
Exploits River (except main stem below Red Indian Lake dam and tributaries above Red Indian Lake dam.	July 23 - August 16	"
Rattling Brook	July 23 - August 16	"
Campbellton River	July 23 - August 16	"
Dog Bay River	July 23 - August 16	"
Gander River (except main stem of Gander and main stem of Northwest & Southwest tributaries)	July 23 - August 16	"
main stem of Northwest & Southwest tributaries)	August 5 - 12	
Ragged Harbour River	July 23 - August 16	"
Anchor Brook	July 23 - August 16	"
Deadman's Bay River	July 23 - August 16	"
Windmill Brook	July 23 - August 16	"
SFA 5 June 15 - September 7		
Northwest Brook (Indian Bay)	August 5 - 12	Low water levels & high water temperatures
Indian Bay Brook	August 5 - 12	"
Northwest River (Trinity)	August 5 - 12	"
Traverse Brook	August 5 - 12	"
Middle Brook	August 5 - 12	"
Gambo River	August 5 - 12	"
Northwest Brook (Alexander Bay)	August 5 - 12	"
Terra Nova River	August 5 - 12	"

Table 1 cont'd

Variations: River	Close dates	Reason for closure
SFA 6 June 15 - September 7		
Bellevue River	July 27 -29	Low water levels & high water temperatures
SFA 7 June 15 - September 7		
Salmon Cove River (CB)	July 27 -29	Low water levels & high water temperatures
North River	July 27 -29	"
South River	July 27 -29	"
SFA 8 June 15 - September 7		
Renews River	July 27 -29	Low water levels & high water temperatures
SFA 9 June 6 - September 7		
Biscay Bay River	July 27 - September 7	Low water levels & high water temperatures
Northwest Brook (Trepassey)	July 27 - September 7	"
Peters River	July 27 - September 7	"
Salmonier River	July 27 -29	"
Colinet River	July 27 -29	"
North Harbour River	July 27 -29	"
Little Salmonier River	July 27 -29	"
Big Barachois River	July 27 -29	"
Branch River	July 27 - August 3	"
- "flats" (causeway to Austin's Rock)	July 23 - September 7	conservation reasons
SFA 10 June 6 - September 7		
Great Barasway River	July 27 -29	Low water levels & high water temperatures
Southeast River (Placentia)	July 27 -29	"
Northeast River (Placentia)	July 27 -29	"
Nonsuch Brook	July 23 - August 16	"
Cape Roger River	July 23 - August 16	"
Bay De L'Eau River	July 23 - August 16	"
Red Harbour River	July 23 - August 16	"
West Brook	July 23-September 7	"
Tides Brook	July 23 -29	"
Salmonier River (Burin)	July 23 - August 3	"
Little St. Lawrence River	July 23 - August 3	"
Lawn River	July 23 - August 3	"
Taylors Bay River	July 23 - August 3	"
Salmonier River (Lamaline)	July 23 -29	"
Piercey's Brook	July 23 - August 3	"
SFA 11 June 6 - September 7		
Grand Bank Brook	July 23 - August 16	Low water levels & high water temperatures
Garnish River	July 23 - August 3	"
Long Harbour River	July 23 - August 16	"
Bay Du Nord River	July 23 - 26; August 12 - 16	"
Simmons Brook	July 23 - 26; August 12 - 16	"
Southwest Brook	July 23 - 26; August 12 - 16	"
Old Bay Brook	July 23 - 26; August 12 - 16	"
Taylors Bay Brook	July 23 - 26; August 12 - 16	"
Long Reach Brook	August 12 - 16	"
Allans Cove Brook	August 12 - 16	"
Bottom Brook	August 12 - 16	"
Hare Bay Rivers	August 12 - 16	"
Bay De Loup River	July 23 - 30	"
Grandy's River (excluding Top Pond Brook)	July 23 - 29	"
- Top Pond Brook	July 23 - August 16	"
Cinq Cerf Brook	July 23 - 30	"
Kings Harbour River	July 23 - 30	"

Table 1 cont'd

	Variations: River	Close dates	Reason for closure
SFA 12	**June 6 - September 7**		
	East Bay River	June 25 - September 7	Low water levels & high water temperatures
	LaPoile River	June 25 - July 2	"
	Farmers Arm Brook	June 25 - July 29	"
	Garia River	June 25 - July 2; & July 23	"
	Northwest Brook (Garia Bay)	June 25 - July 2; & July 23	"
	Burnt Island Brook	June 25 - July 15; July 20 - 28	"
	Isle aux Morts River	June 25 - July 15; July 20 - 28	"
	Grand Bay Brook	June 25 - July 28	"
SFA 13	**June 1 - September 7**		
	Bear Cove Brook	June 25 - September 7	Low water levels & high water temperatures
	Little Codroy River	June 25-July 15; July 21-28; Aug 5-9	"
	Grand Codroy River	June 25-July 15; July 21-28; Aug 5-9	"
	Highlands River	Closed in 1999	
	Crabbes River (H & R)	June 25 - July 28; August 5 - 9	Low water levels & high water temperatures
	Barachois River (H & R)	June 25 - July 28; August 5 - 9	"
	Robinsons River (H & R)	June 25 - July 15; July 21 - 28	"
	Fishells River	Closed in 1999	
	Flat Bay Brook (H & R)	June 25 - 29	Low water levels & high water temperatures
	Little Barachois Brook	June 25-July 15; July 21-28; Aug 5-9	"
	Southwest & Bottom Brook	June 25-July 15; July 21-28; Aug 5-9	"
	Harry's River (H & R)	June 25 - 29	"
	Fox Island River	July 21 - 28	"
	Hughes Brook (H & R)	July 21 - August 9	"
SFA 14A	**June 15 - September 7**		
	Little Brook Ponds	August 5 - 9	Low water levels & high water temperatures
	Parker River (West Brook) Pistolet Bay	July 8 - August 10	"
SFA 14B	**June 15 - Sept 15**		

Table 2. Atlantic salmon smolt-to-adult survival (back to the river) for Campbellton River (SFA 4), Northeast Brook, Trepassey, and Rocky River (SFA 9), Conne River (SFA 11), Highlands River (SFA 13), and Western Arm Brook (SFA 14A). Repeat spawners are included in counts. Adjusted smolt counts for Rocky River are bold.

	Campbellton River			Northeast Brook			Rocky River			Conne River[1]			Highlands River			Western Arm Brook		
Year (i)	Smolts year i	Sm. sal. year i+1	% Surv.	Smolts year i	Sm. sal. year i+1	% Surv.	Smolts year i	Sm. sal. year i+1	% Surv.	Smolts year i	Sm. sal. year i+1	% Surv.	Smolts year i	Sm. sal. year i+1	% Surv.	Smolts year i	Sm. sal. year i+1	% Surv.
1971																5735	406	7.1
1972																11905	797	6.7
1973																8484	506	6.0
1974																11854	639	5.4
1975																9600	552	5.8
1976																6232	373	6.0
1977																9899	315	3.2
1978																13071	1578	12.1
1979																8349	465	5.6
1980													15028	127		15665	492	3.1
1981													15839	100		13981	467	3.3
1982																12477	1141	9.1
1983																10552	235	2.2
1984																20653	467	2.3
1985																13417	527	3.9
1986				1117	91	8.1										17719	437	2.5
1987				1404	97	6.9				74585	7627	10.2				17029	422	2.5
1988				1692	62	3.7				65692	4968	7.6				15321	455	3.0
1989				1708	71	4.2				73724	5368	7.3				11407	444	3.9
1990				1902	99	5.2	8287	211	2.5	56943	2411	4.2				10563	233	2.2
1991				1911	49	2.6	7732	237	3.1	74645	2523	3.4				13453	480	3.6
1992				1674	79	4.7	7813	292	3.7	68208	2703	4.0				15405	947	6.1
1993	31577	2857	9.0	1849	99	5.4	***5115***	158	3.1	55765	1533	2.7	9986	145	1.5	13435	954	7.1
1994	41633	3035	7.3	944	80	8.5	9781	385	3.9	60762	3502	5.8	10503	172	1.6	9283	823	8.9
1995	39715	3208	8.1	792	73	9.2	7577	356	4.7	57733 *	4154	7.2	12160	199	1.6	15144	1230	8.1
1996	58369	1975	3.4	1749	50	2.9	***14261***	435	3.1	94088	3200	3.4	12383	398	3.2	14502	509	3.5
1997	62050	3275	5.3	1829	91	5.0	***16900***	423	2.5	100983	2931	2.9	6776	96	1.4	23845	1718	7.2
1998	50441	3076	6.1	1727	95	5.5	***12163***	327	2.7	69841	2358	3.4	5922	146	2.5	17139	1046	6.1
1999	47256			1419			***8625***			63658			9634			13500		

[1]Includes Native food fishery.

* 57733 excludes 5016 removed to Roti Bay.

4154 small salmon for Conne River 1996 excludes 286 fish from the wild smolt aquaculture experiment.

Table 3. Counts of small salmon from fishways and counting fences in insular Newfoundland 1974-99 by Salmon Fishing Area (SFA). Also shown are means, coefficients of variation, 95% confidence limits (LCL and UCL), and percentage change for 1999 in relation to 1998, and the 1984-89, 1986-91, and 1992-98 means. Partial counts are in parentheses and are not included in statistical calculations. Adusted counts are bold.

	SFA 3	SFA 4				SFA 5					SFA 9		SFA 10	SFA 11		SFA 13			SFA 14A		
Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1974		2538		857			(770)		162				223						41	38	382
1975		9218					(1119)		778				(186)						1	191	631
1976		3991							335				294						132	341	520
1977		6148							371										192	789	362
1978		3790		755			1403	810	436				390						117	971	293
1979		6715		(404)			(1350)	569	455				454						195	1984	1578
1980				997			1712	843	420				433			82			301	792	435
1981		8114		2459			2414	1115	619				334			127			110	2101	451
1982		7605		1425			1281	963	625				86			100			275	2112	394
1983				978			1195	1210	853				233						220	2007	1141
1984		17219		1081			1379	1233	904		89		419						440	1805	120
1985		16652		1663			904	1557	960		124		384						190	1553	416
1986		9697		1064			1036	1051	726		158		725		7515				354	2815	525
1987		9014		493			914	974	570		91	80	325	64	9687				355	2505	378
1988		8974		1562			772	1737	795		97	313	543	65	7118				437	2075	251
1989		7192		596	7743		496	1138	668		62	168	706	102	4469					1369	455
1990		6629		345	7520		745	1149	(410)		71	401	551	158	4321			12216		2296	444
1991		5245		245	6445		562	873	(311)		99	211	353	55	2086			5724		1441	233
1992		12538		1168	18179		1182	1443	886		49	237	921	104	1973		222	17571	435	2347	480
1993		21319	4001	1560	25905		1959	(2713)	962		79	292	847	169	2355	137	576	18477	526	4009	947
1994		16168	2857	968	18080		1513	1571	1179		99	158	677	73	1533	145	562	7995	701	3592	954
1995		15691	3035	1600	22002		1139	2258	1298	442	80	385	663	118	3498	172	753	27898	1003	5800	823
1996	579	29726	3208	946	23665		1751	2005	1285	593	73	356	1225	674	4436	199	601	30445	601	6923	1230
1997	(338)	13552	1975	465	10476	1375	1221	1577	979	(408)	50	435	641	399	2678	398	613	14866	783	3659	509
1998	(351)	26333	3275	1295	18742	2636	2405	1780	1332	540	91	423	756	264	2931	96	593	13016	542	4999	1718
1999	(432)	28252	3076	1105	18461	2219	1802	1836	1198	314	95	327	336	307	2357	146	608	27585	829	4008	1046
$\bar{X}$ 1984-89		11458		1077			917	1282	771		104	187	517	77	7197				355	2020	358
CV		38		45			32	24	19		32	63	33	28	30				29	28	41
95% UCL		16000		1580			1223	1598	924		138	479	695	131	10603				481	2606	513
95% LCL		6916		573			610	965	617		69	-105	339	23	3791				229	1434	202
N		6		6			6	6	6		6	3	6	3	4				5	6	6
$\bar{X}$ 1986-91		7792		718	7236		754	1154	690		96	235	534	89	5866				382	2084	381
CV		22		70	10		27	26	14		35	53	32	48	47				12	28	31
95% UCL		9593		1244	8960		969	1473	841		132	390	711	142	8741				500	2692	504
95% LCL		5991		191	5512		540	835	538		61	79	356	36	2991				264	1475	258
N		6		6	3		6	6	4		6	5	6	5	6				3	6	6
$\bar{X}$ 1992-98		19332	3059	1143	19578		1596	1907	1132		74	327	819	257	2772	191	560	18610	656	4476	952
CV		34	22	35	26		30	24	16		26	31	25	84	35	56	29	43	29	34	45
95% UCL		25465	3750	1508	24208		2032	2326	1303		92	421	1010	457	3672	304	710	26022	833	5899	1348
95% LCL		13199	2367	778	14949		1159	1487	960		57	232	627	58	1872	79	410	11197	479	3052	556
N		7	6	7	7		7	7	7		7	7	7	7	7	6	7	7	7	7	7
% change 1999 vs.																					
1998	23	7	-6	-15	-1	-16	-25	3	-10	-42	4	-23	-56	16	-20	52	3	112	53	-20	-39
1984-89 mean		147		3			97	43	55		-8	75	-35	299	-67				133	98	193
1986-91 mean		263		54	155		139	59	74		-1	39	-37	246	-60				117	92	175
1992-98 mean		46	1	-3	-6		13	-4	6		28	0	-59	19	-15	-24	9	48	26	-10	10

1. Main River (Sop's Arm)
2. Exploits River (Bishop's Falls)
3. Campbellton River
4. Salmon Brook (Gander River)
5. Gander River
6. Indian Bay Brook
7. Middle Brook
8. Terra Nova River (Lower)
9. Terra Nova River (Upper)
10. Northwest River, Port Blandford
11. Northeast Brook, Trepassey
12. Rocky River
13. Northeast River, Placentia
14. Little River
15. Conne River
16. Highlands River
17. Pinchgut Brook
18. Humber River
19. Lomond River
20. Torrent River
21. Western Arm Brook

Table 4. Counts of large salmon from fishways and counting fences in insular Newfoundland 1974-99 by Salmon Fishing Area (SFA). Also shown are means, coefficients of variation, 95% confidence limits (LCL and UCL), and percentage change for 1999 in relation to 1998, and the 1984-89, 1986-91, and 1992-98 means. Partial counts are in parentheses and are not included in statistical calculations. Adjusted counts are bold.

	SFA 3	SFA 4				SFA 5					SFA 9		SFA 10	SFA 11		SFA 13			SFA 14A		
Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1974		411		9			(77)		121				9						33	3	4
1975		1439					(9)		52				(36)						0	25	1
1976		460							37				56						11	47	0
1977		582							262										11	33	3
1978		303		52			16	20	89				32						12	21	1
1979		277		(6)			(54)	170	30				37						1	39	0
1980				15			91	39	17				34			55			19	63	3
1981		(1695)		33			39	90	28				62			29			50	97	1
1982		(181)		18			20	19	8				36			56			16	523	3
1983				12			75	57	76				22						7	442	4
1984		529		38			57	107	98		33		44						47	288	0
1985		183		26			27	112	60		41		0						14	30	1
1986		355		12			15	140	58		30		39		397				32	92	0
1987		310		9			19	56	38		30	1	16	3	498				11	68	1
1988		147		24			14	206	45		19	6	11	3	418				21	44	1
1989		89		24	473		19	142	51		18	9	15	5	319					60	0
1990		122		8	508		13	144	(34)		9	17	25	15	361			855		82	0
1991		99		2	670		14	114	(26)		13	16	8	6	87			401		71	1
1992		314		101	4162		43	270	224		10	46	46	21	154		5	2945	80	169	8
1993		627	145	87	1734		87	(470)	173		17	72	65	11	98	78	43	636	34	222	8
1994		916	191	83	1072		90	242	172		15	19	70	11	100	148	47	1030	50	331	31
1995		941	218	125	1121		168	634	260	135	12	39	74	17	107	120	28	2064	95	611	33
1996	49	2053	560	112	1753		161	461	185	203	15	45	123	127	179	142	38	2679	93	507	50
1997	(65)	886	321	119	1883	352	262	527	173	(115)	9	89	185	79	182	157	68	2595	72	666	55
1998	(31)	1953	402	141	3649	336	196	390	143	104	11	130	287	49	294	117	63	4855	126	757	128
1999	(34)	2235	493	138	4815	365	130	343	76	93	18	77	167	49	241	82	63	4433	113	399	22
$\bar{X}$ 1984-89		269		22			25	127	58		29	5	21	4	408				25	97	1
CV		60		47			65	39	36		31	76	82	31	18				59	99	110
95% UCL		439		33			42	179	80		38	15	39	7	525				43	198	1
95% LCL		99		11			8	75	36		19	-5	3	1	291				7	-4	-0
N		6		6			6	6	6		6	3	6	3	4				5	6	6
$\bar{X}$ 1986-91		187		13	550		16	134	48		20	10	19	6	347				21	70	1
CV		62		68	19		17	36	18		44	69	60	78	41				49	24	110
95% UCL		308		23	811		18	185	62		29	18	31	13	494				47	87	1
95% LCL		66		4	289		13	83	34		11	1	7	0	199				-5	52	-0
N		6		6	3		6	6	4		6	5	6	5	6				3	6	6
$\bar{X}$ 1992-98		1099	306	110	2196		144	428	190		13	63	121	45	159	127	42	2402	79	466	45
CV		60	51	19	55		52	33	21		23	59	71	98	44	23	51	58	39	49	92
95% UCL		1705	469	129	3323		213	557	226		15	97	202	86	224	157	61	3687	107	678	83
95% LCL		492	143	90	1070		74	299	154		10	28	41	4	95	97	22	1117	50	255	7
N		7	6	7	7		7	7	7		7	7	7	7	7	6	7	7	7	7	7
% change 1999 vs. 1998	10	14	23	-2	32	9	-34	-12	-47	-11	64	-41	-42	0	-18	-30	0	-9	-10	-47	-83
1984-89 mean		731		523			417	170	30		-37	1344	702	1236	-41				352	311	4300
1986-91 mean		1095		948	775		730	157	58		-9	686	779	666	-30				430	474	4300
1992-98 mean		103	61	26	119		-10	-20	-60		42	23	38	9	51	-35	51	85	44	-14	-51

1. Main River (Sop's Arm)
2. Exploits River (Bishop's Falls)
3. Campbellton River
4. Salmon Brook (Gander River)
5. Gander River
6. Indian Bay Brook
7. Middle Brook
8. Terra Nova River (Lower)
9. Terra Nova River (Upper)
10. Northwest River, Port Blandford
11. Northeast Brook, Trepassey
12. Rocky River
13. Northeast River, Placentia
14. Little River
15. Conne River
16. Highlands River
17. Pinchgut Brook
18. Humber River
19. Lomond River
20. Torrent River
21. Western Arm Brook

Table 5. Total returns of small salmon to rivers in insular Newfoundland 1984-99 by Salmon Fishing Area (SFA). Also shown are means and standard deviations for 1984-89, 1986-91, and 1992-98.

	SFA 4			SFA 5				SFA 9		SFA 10	SFA 11		SFA 13			SFA 14A		
Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1984	19028				1675	1534		89		459						986	1805	235
1985	17555				1283	2012		124		519						393	1623	467
1986	10343				1547	1459		158		879		8302				725	3155	527
1987	9481				1053	1404		91	80	350	64	10155				652	2670	437
1988	9496				1337	2114		97	313	637	65	7627				841	2388	422
1989	7577		7743		626	1377		62	168	809	102	4968				652	1512	455
1990	6995		7740		1070	1518		71	401	699	158	5368			12216	777	2518	444
1991	5659		6745		763	1127		99	211	368	55	2411			5724	731	1591	233
1992	13508		18179		1563	1780		49	237	956	104	2523		222	17571	794	2832	480
1993	22253	4001	26205		2247	3050		79	292	980	169	2703	137	576	18477	816	4215	947
1994	17603	2857	18273		1844	2035		99	158	710	73	1533	145	562	7995	1038	3827	954
1995	16230	3035	22266		1448	2638	498	80	385	774	118	3502	172	753	27898	1365	6168	823
1996	30429	3208	23946		2112	2575	593	73	356	1420	674	4440	199	601	30445	982	7371	1230
1997	15263	1975	10599	1439	1287	1800	466	50	435	723	399	3200	398	613	14866	1300	4033	509
1998	27093	3275	18805	2716	2549	1815	540	91	423	885	264	2931	96	593	13016	766	5329	1718
1999	28802	3076	18491	2248	1950	1952	314	95	327	363	307	2358	146	608	27585	1091	4330	1046
$\bar{X}$ 1984-89	12247				1254	1650		104	187	609	77	7763				708	2192	424
SD	4792				376	326		33	118	206	22	2148				200	653	99
$\bar{X}$ 1986-91	8259		7409		1066	1500		96	235	624	89	6472				730	2306	420
SD	1799		575		344	329		34	125	222	43	2765				73	640	99
$\bar{X}$ 1992-98	20340	3059	19753		1864	2242	524	74	327	921	257	2976	191	560	18610	1009	4825	952
SD	6428	659	5081		461	509	55	19	102	245	215	898	107	162	8015	243	1555	428

1. Exploits River (Bishop's Falls)
2. Campbellton River
3. Gander River
4. Indian Bay Brook
5. Middle Brook
6. Terra Nova River
7. Northwest River, Port Blandford
8. Northeast Brook, Trepassey
9. Rocky River
10. Northeast River, Placentia
11. Little River
12. Conne River
13. Highlands River
14. Pinchgut Brook
15. Humber River
16. Lomond River
17. Torrent River
18. Western Arm Brook

Table 6. Total returns of large salmon to rivers in insular Newfoundland 1984-99 by Salmon Fishing Area (SFA). Also shown are means and standard deviations for 1984-89, 1986-91, and 1992-98.

	SFA 4			SFA 5				SFA 9		SFA 10	SFA 11		SFA 13			SFA 14A		
Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1984	529				57	107		33		44						75	288	0
1985	183				27	112		41		0						14	30	1
1986	355				15	140		30		39		412				37	93	0
1987	310				19	56		30	1	16	3	516				12	68	1
1988	147				14	206		19	6	11	3	420				24	44	1
1989	89		473		19	142		18	9	15	5	320				22	60	0
1990	122		508		13	144		9	17	25	15	372			855	19	82	0
1991	99		670		14	114		13	16	8	6	89			401	21	71	1
1992	314		4162		43	270		10	46	46	21	159		5	2945	86	170	8
1993	627	145	1734		88	472		17	72	65	11	100	78	43	636	38	224	8
1994	916	191	1072		90	246		15	19	70	11	100	148	47	1030	56	332	31
1995	941	218	1121		168	638	135	12	39	74	17	110	120	28	2064	101	615	33
1996	2053	560	1753		161	472	203	15	45	123	127	179	142	38	2679	98	509	50
1997	881	321	1883	353	262	528	182	9	89	185	79	185	157	68	2595	77	674	55
1998	1959	402	3649	336	196	390	104	11	130	287	49	295	117	63	4865	128	766	128
1999	2236	493	4822	365	130	343	93	18	77	167	49	241	82	63	4433	121	411	22
$\bar{X}$ 1984-89	269				25	127		29	5	21	4	417				31	97	1
SD	162				16	50		9	4	17	1	80				23	96	1
$\bar{X}$ 1986-91	187		550		16	134		20	10	19	6	355				23	70	1
SD	115		105		3	49		9	7	11	5	145				8	17	1
$\bar{X}$ 1992-98	1099	306	2196		144	431	156	13	63	121	45	161	127	42	2402	83	470	45
SD	658	155	1218		75	140	45	3	37	87	44	69	29	21	1390	30	231	41

1. Exploits River (Bishop's Falls)
2. Campbellton River
3. Gander River
4. Indian Bay Brook
5. Middle Brook
6. Terra Nova River
7. Northwest River, Port Blandford
8. Northeast Brook, Trepassey
9. Rocky River
10. Northeast River, Placentia
11. Little River
12. Conne River
13. Highlands River
14. Pinchgut Brook
15. Humber River
16. Lomond River
17. Torrent River
18. Western Arm Brook

Table 7. Percentage change in total returns of small salmon in 1999 in relation to 1998, the 1984-89, 1986-91 and 1992-98 means.

Counting Facility	Total Returns Small Salmon* 1999	Percent Change from 1998	1984-89 mean	1986-91 mean	1992-98 mean
SFA 4					
Exploits River	28802	6	135	249	42
Campbellton River	3076	-6			1
Gander River	18491	-2		150	-6
SFA 5					
Indian Bay Brook	2248	-17			
Middle Brook	1950	-23	56	83	5
Terra Nova River	1952	8	18	30	-13
Northwest River (TNNP)	314	-42			-40
SFA 9					
Northeast Brook (Trep.)	95	4	-8	-1	28
Rocky River	327	-23		39	0
SFA 10					
Northeast River (Plac.)	363	-59	-40	-42	-61
SFA 11					
Little River	307	16		246	19
Conne River	2358	-20		-64	-21
SFA 13					
Highlands River	146	52			-24
Pinchgut Brook	608	3			9
Humber River	27585	112			48
SFA 14A					
Lomond River	1091	42	54	50	8
Torrent River	4330	-19	98	88	-10
Western Arm Brook	1046	-39	147	149	10

*Preliminary

Table 8. Percentage change in total returns of large salmon in 1999 in relation to 1998, the 1984-89, 1986-91 and 1992-98 means.

Counting Facility	Total Returns Large Salmon* 1999	Percent Change from 1998	1984-89 mean	1986-91 mean	1992-98 mean
SFA 4					
Exploits River	2236	14	732	1096	104
Campbellton River	493	23			61
Gander River	4822	32		776	120
SFA 5					
Indian Bay Brook	365	9			
Middle Brook	130	-34	417	730	-10
Terra Nova River	343	-12	170	157	-20
Northwest River (TNNP)	93	-11			-40
SFA 9					
Northeast Brook (Trep.)	18	64	-37	-9	42
Rocky River	77	-41		686	23
SFA 10					
Northeast River (Plac.)	167	-42	702	779	38
SFA 11					
Little River	49	0		666	9
Conne River	241	-18		-32	50
SFA 13					
Highlands River	82	-30			-35
Pinchgut Brook	63	0			51
Humber River	4433	-9			85
SFA 14A					
Lomond River	121	-5	295	438	45
Torrent River	411	-46	323	490	-13
Western Arm Brook	22	-83	4300	4300	-51

*Preliminary

Table 9. Proportions of large salmon in total returns to rivers in insular Newfoundland during 1992-99 and mean proportions for 1984-89, 1986-91, and 1992-98.

	Proportion of large salmon										
River Name	1992	1993	1994	1995	1996	1997	1998	1999	84-89 mean	86-91 mean	92-98 mean
SFA 4											
Exploits River (Bishop's Falls)	0.023	0.027	0.049	0.055	0.063	0.055	0.067	0.072	0.021	0.022	0.051
Campbellton River	-	0.035	0.063	0.067	0.149	0.140	0.109	0.138	-	-	0.091
Gander River	0.186	0.062	0.055	0.048	0.068	0.151	0.163	0.207	-	0.069	0.100
SFA 5											
Indian Bay Brook	-	-	-	-	-	0.197	0.110	0.140	-	-	-
Middle Brook	0.027	0.038	0.047	0.104	0.071	0.169	0.071	0.063	0.020	0.014	0.072
Terra Nova River	0.132	0.134	0.108	0.195	0.155	0.227	0.177	0.149	0.072	0.082	0.161
Northwest River (Port Blandford)	-	-	-	0.213	0.255	0.281	0.161	0.229	-	-	0.229
SFA 9											
Northeast Brook (Trepassey)	0.169	0.177	0.132	0.130	0.170	0.153	0.108	0.159	0.216	0.171	0.146
Rocky River	0.163	0.198	0.107	0.092	0.112	0.170	0.235	0.191	-	0.040	0.161
SFA 10											
Northeast River (Placentia)	0.046	0.062	0.090	0.087	0.080	0.204	0.245	0.315	0.033	0.030	0.116
SFA 11											
Little River	0.168	0.061	0.131	0.126	0.159	0.165	0.157	0.138	-	0.067	0.149
Conne River	0.059	0.036	0.061	0.030	0.039	0.055	0.091	0.093	-	0.052	0.051
SFA 13											
Highlands River	-	0.363	0.505	0.411	0.416	0.283	0.549	0.360	-	-	0.399
Pinchgut Brook	0.022	0.069	0.077	0.036	0.059	0.100	0.096	0.094	-	-	0.069
Humber River	0.144	0.033	0.114	0.069	0.081	0.149	0.272	0.138	-	-	0.114
SFA 14A											
Lomond River	0.098	0.044	0.051	0.069	0.091	0.056	0.143	0.100	0.042	0.030	0.076
Torrent River	0.057	0.050	0.080	0.091	0.065	0.143	0.126	0.087	0.042	0.029	0.089
Western Arm Brook	0.016	0.008	0.031	0.039	0.039	0.098	0.069	0.021	0.001	0.001	0.045

Table 10. Newfoundland Region summary of the conservation egg requirement attained for various rivers for years prior to the commercial salmon fishing moratorium (1984-91) and the eight years during the moratorium (1992-99). Also shown are the means for 1984-91 and 1992-99.

SFA	River	Percentage conservation level met																% Conservation met 1984-1991	% Conservation met 1992-1999
		1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999		
4	Exploits River	39	37	32	33	37	36	26	16	31	43	31	39	69	24	48	50	32.0	41.9
	Lower	123	100	66	62	59	46	45	34	101	157	103	121	210	72	146	146	66.9	132.0
	Middle	20	17	8	9	12	14	12	16	20	23	18	24	43	15	35	35	13.5	26.6
	Upper	29	53	72	97	125	119	88	0	2	6	7	12	26	10	6	7	72.9	9.5
	Campbellton River										311	239	279	304	200	311	326		281.4
	Gander River						44	38	36	118	128	91	95	124	62	110	121	39.3	106.1
5	Indian Bay Brook														113	183	161		152.3
	Middle Brook	131	84	89	90	55	49	74	51	148	238	174	114	250	196	301	227	77.9	206.0
	Terra Nova River	18	23	17	14	28	19	19	15	28	53	26	45	36	32	32	34	19.1	35.8
	Northwest Brook												37	55	46	42	28		41.6
9	Biscay Bay River	156	126	230	119	117	87	122	38	141	97	143	77	117				124.4	115.0
	Northeast Brook (Trepassey)	229	312	368	227	213	173	156	249	126	193	239	194	196	135	256	248	240.9	198.4
	Rocky River	64	29	59	22	30	17	40	22	28	34	25	56	34	56	54	39	35.4	40.8
10	Northeast River (Placentia)	204	152	352	166	247	302	269	175	555	527	434	422	736	496	484	269	233.4	489.1
11	Conne River - Conservation			262	394	285	185	201	93	87	110	72	147	204	125	150	122	236.7	127.1
	Management			146	219	159	103	112	51	48	61	40	82	114	70	84	68	131.7	70.9
13	Highlands River										46	77	67	79	105	59	49		68.9
	Crabbes River									34	13	41		68	95	44	65		51.4
	Middle Barachois Brook									53	48	74		52	97		44		61.3
	Robinsons River									57	23	65		67	91		117		70.0
	Fischells River									14	24	71			44	23	110		47.7
	Flat Bay Brook									18	14	19	45	85	89		149		59.9
	Harry's River									12	37	46	48	52	50	49	49		42.9
	- Pinchgut Brook									36	117	145	150	130	140	136	138		124.0
	Humber River							60	27	117	96	40	128	186	115	120	201	43.5	125.4
14A	Lomond River	74	31	59	56	70	61	62	64	121	118	142	187	143	161	151	181	59.6	150.5
	Torrent River	270	161	360	199	266	225	221	178	313	538	530	1033	1279	797	924	680	235.0	761.8
	Western Arm Brook	30	80	156	103	67	142	157	68	151	288	292	286	415	200	625	370	100.4	328.4

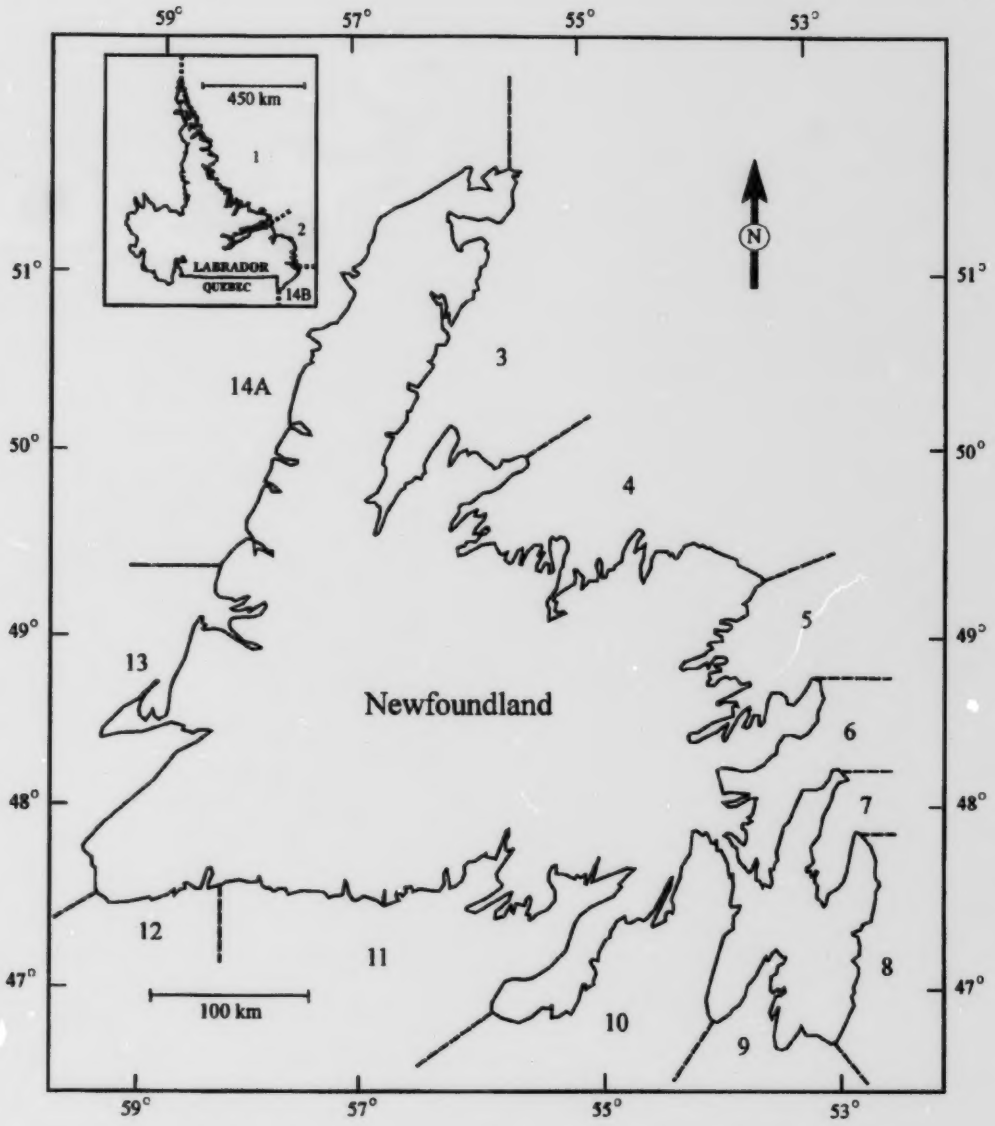

Fig. 1. Map showing the 14 Salmon Fishing Areas of the Newfoundland Region.

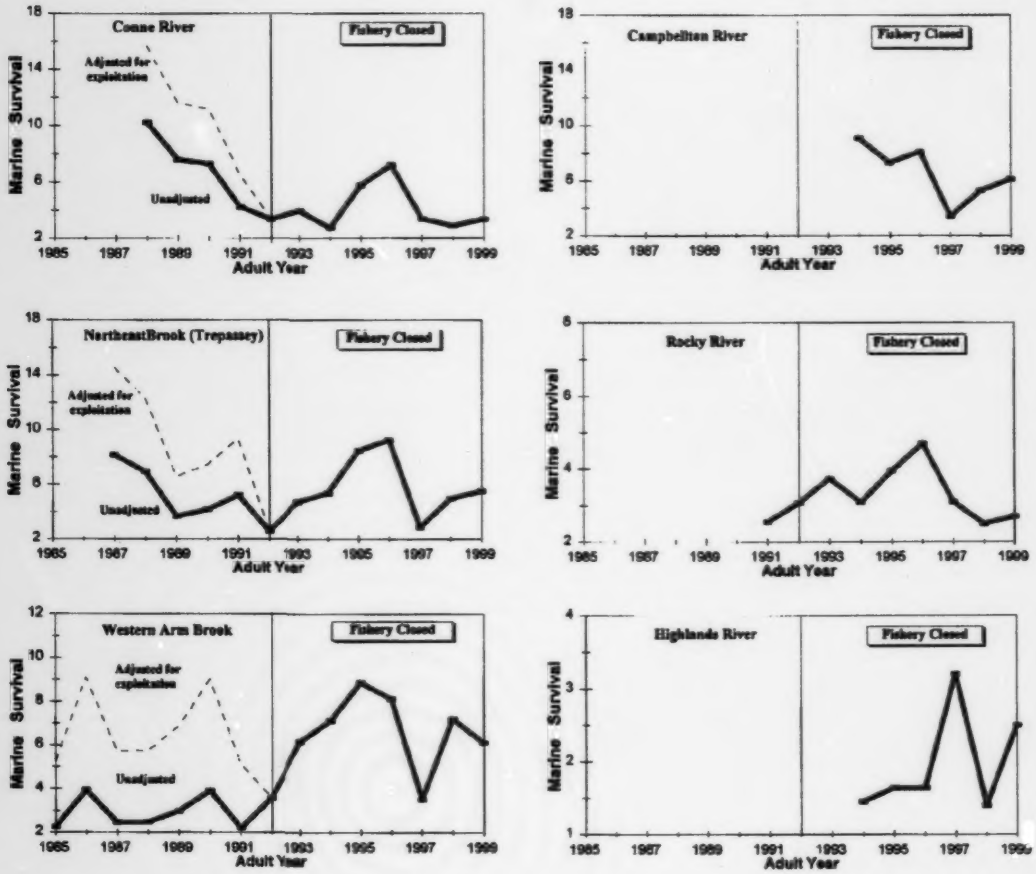

Fig. 2. Estimates of marine survival from smolts in year i to adult small salmon in year i+1. Dashed line represents marine survival adjusted for average marine exploitation rate (from Dempson *et al.* MS 1998).

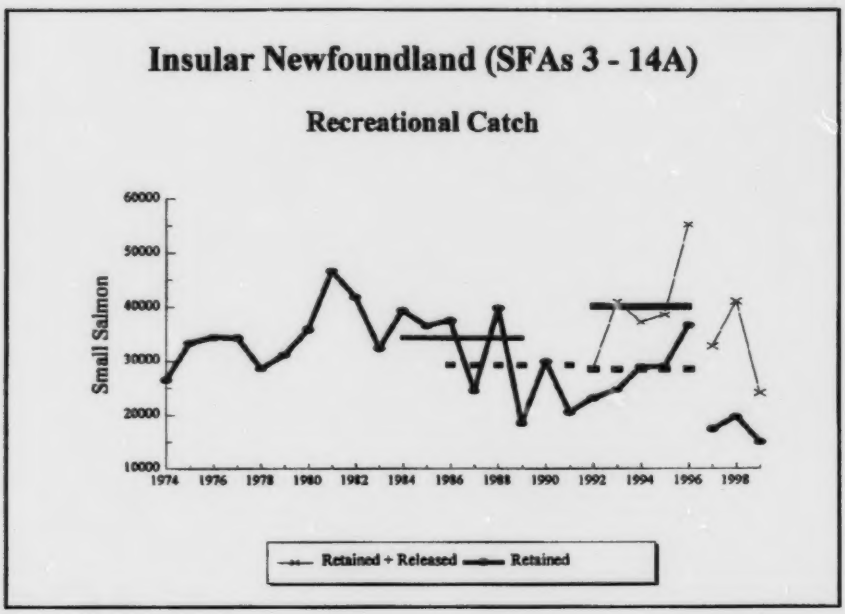

Fig. 3. Recreational catch of small salmon (retained, 1974-99; retained plus released, 1992-99), for Insular Newfoundland (SFAs 3-14A). The thin solid horizontal line represents the 1984-89 mean, the thin broken horizontal line the 1986-91 mean, the thick solid line the 1992-96 mean (retained + released) and the thick broken line the 1992-96 mean (retained only). For some rivers in SFAs 12 & 13, 1996, where DFO data were unavailable, license stub return data were used. The 1997-99 catch data, obtained from the license stub return, are represented by a non-continuous line.

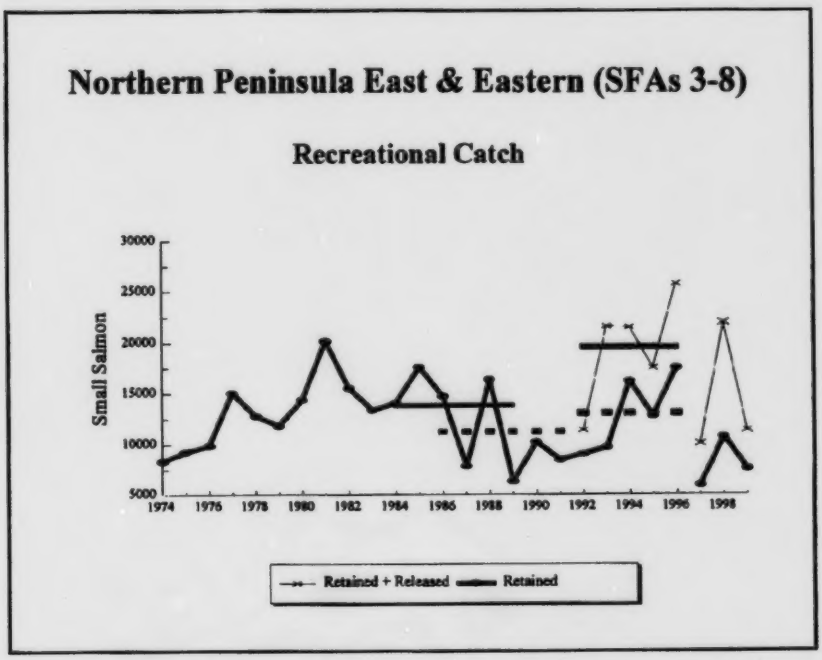

Fig. 4. Recreational catch of small salmon (retained, 1974-99; retained plus released, 1992-99), for Northern Peninsula East & Eastern (SFAs 3-8). The thin solid horizontal line represents the 1984-89 mean, the thin broken horizontal line the 1986-91 mean, the thick solid line the 1992-96 mean (retained + released) and the thick broken line the 1992-96 mean (retained only). The 1997-99 catch data, obtained from the license stub return, are represented by a non-continuous line.

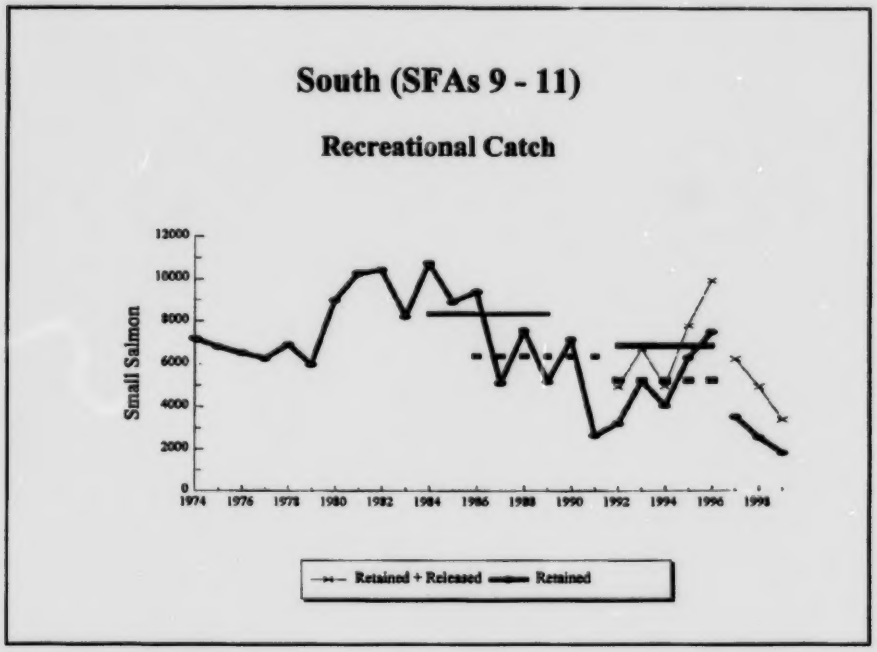

Fig. 5. Recreational catch of small salmon (retained, 1974-99; retained plus released, 1992-99), for South (SFAs 9-11). The thin solid horizontal line represents the 1984-89 mean, the thin broken horizontal line the 1986-91 mean, the thick solid line the 1992-96 mean (retained + released) and the thick broken line the 1992-96 mean (retained only). The 1997-99 catch data, obtained from the license stub return, are represented by a non-continuous line.

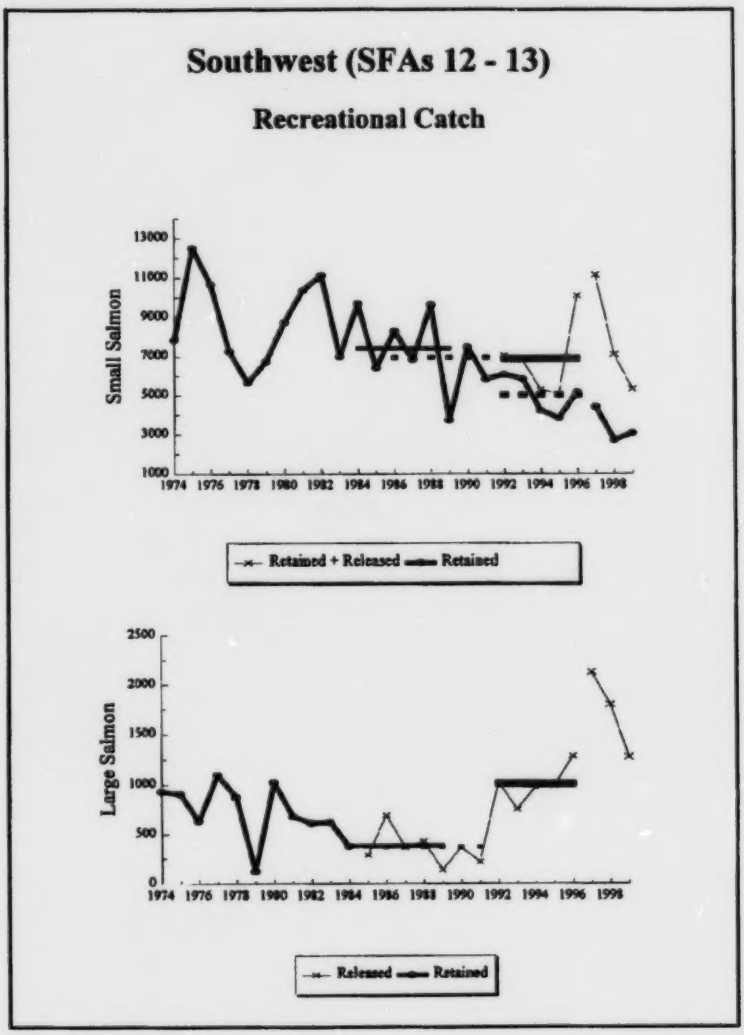

Fig. 6. Recreational catch of small salmon (retained, 1974-99; retained plus released, 1992-99), for Southwest (SFAs 12 - 13). The catch of large salmon prior to 1985 is retained and for 1985-99 is released. The thin solid horizontal line represents the 1984-89 mean, the thin broken horizontal line the 1986-91 mean, the thick solid line the 1992-96 mean (retained + released) and the thick broken line the 1992-96 mean (retained only). The 1997-99 catch data, obtained from the licnese stub return, are represented by a non-continuous line.

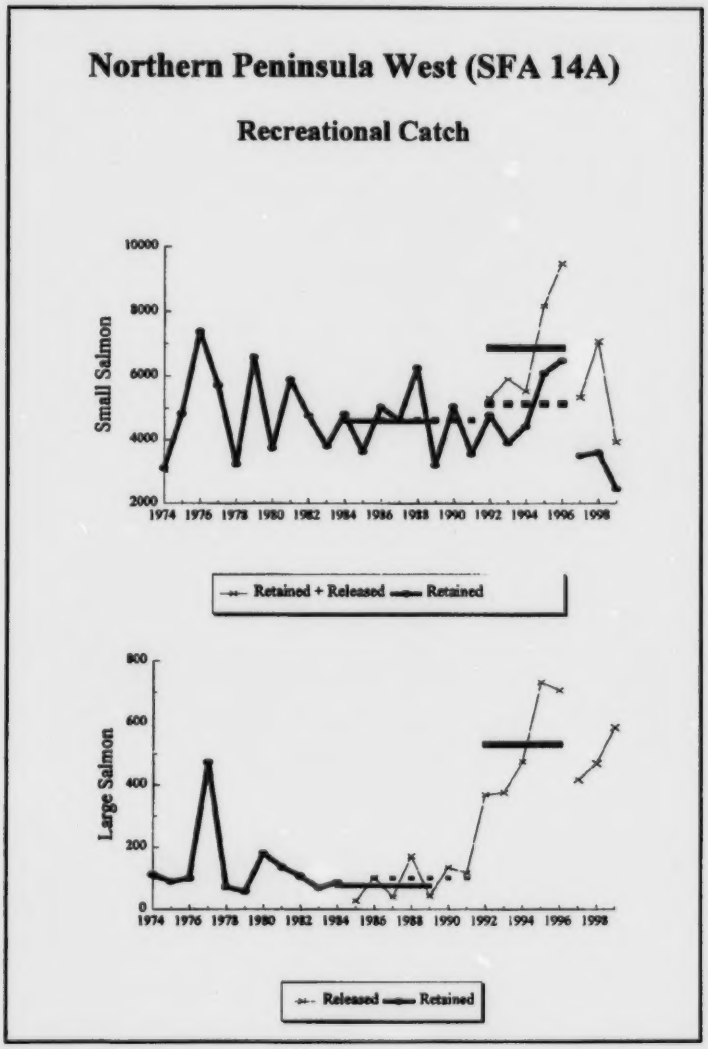

Fig. 7. Recreational catch of small salmon (retained, 1974-99; retained plus released, 1992-99), for Northern Peninsula West (SFA 14A). The catch of large salmon prior to 1985 is retained and for 1985-98 is released. The thin solid horizontal line represents the 1984-89 mean, the thin broken horizontal line the 1986-91 mean, the thick solid line the 1992-96 mean (retained + released) and the thick broken line the 1992-96 mean (retained only). The 1997-99 catch data, obtained from the license stub return, are represented by a non-continuous line.

Salmon Fishing Area 4
Total Returns - Small Salmon

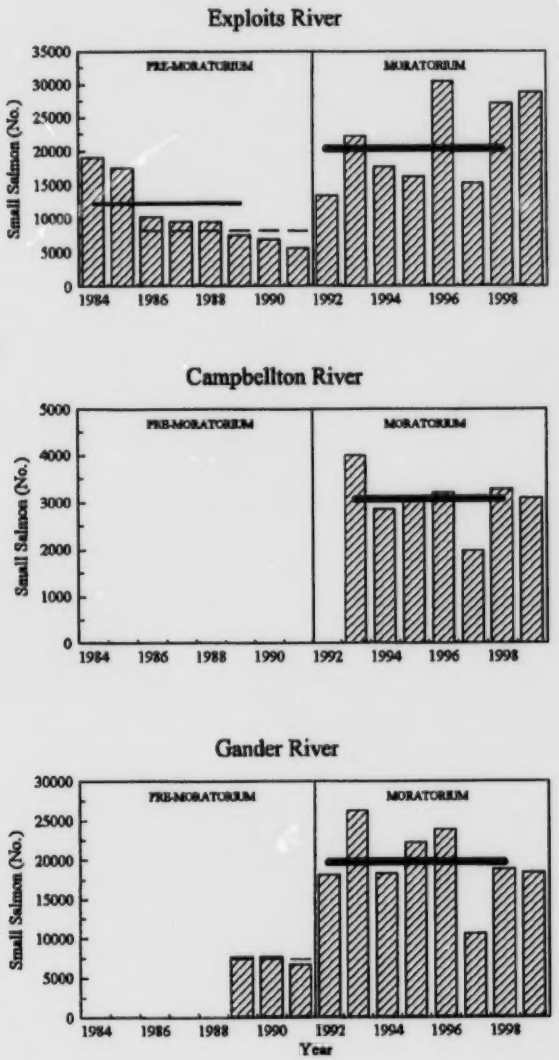

Fig. 8. Total returns of small salmon to Exploits River, Campbellton River and Gander River (SFA 4), 1984-99. The thin solid horizontal line represents the 1984-89 mean, the broken line the 1986-91 mean, and the thick solid line the 1992-98 mean.

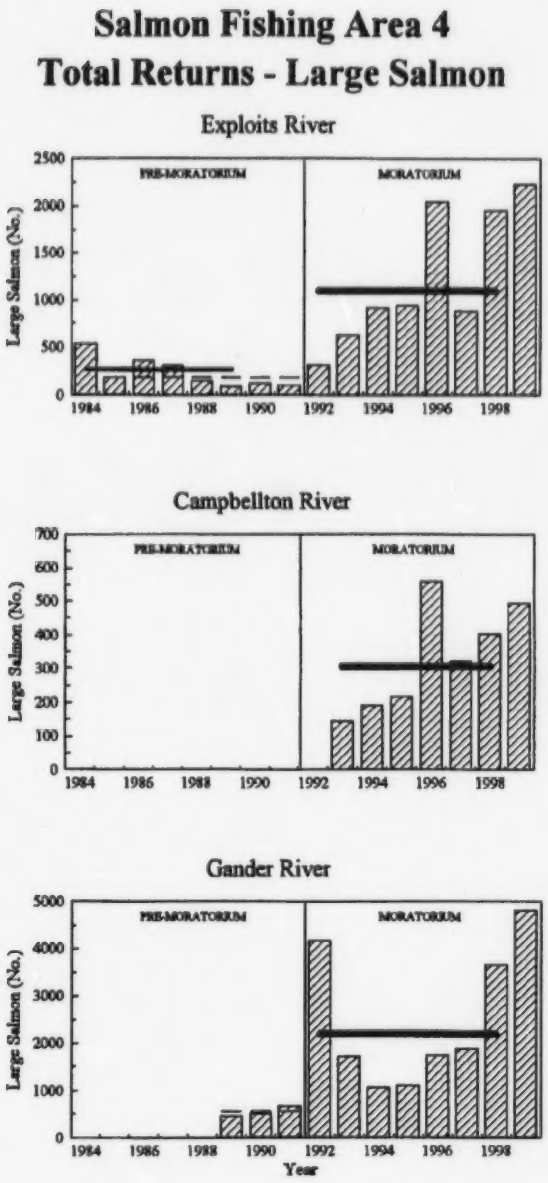

Fig. 9. Total returns of large salmon to Exploits River, Campbellton River and Gander River (SFA 4), 1984-99. The thin solid horizontal line represents the 1984-89 mean, the broken line the 1986-91 mean, and the thick solid line the 1992-98 mean.

Salmon Fishing Area 4

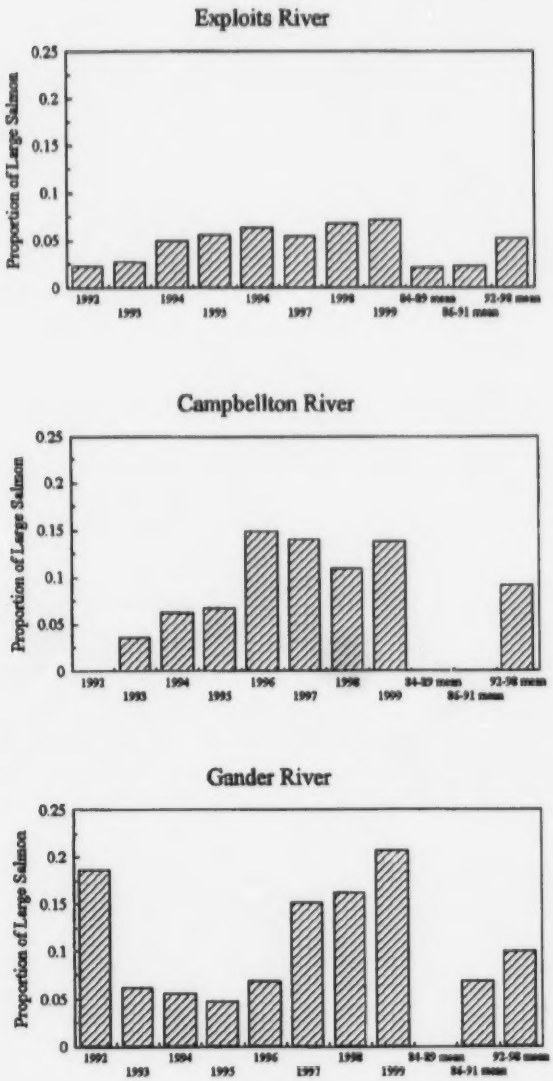

Fig. 10. Proportion of large salmon in total returns for Exploits River (Bishop's Falls), Campbellton River and Gander River, SFA 4, 1992-99, and the 1984-89, 1986-91 and 1992-98 means.

Salmon Fishing Area 5
Total Returns - Small Salmon

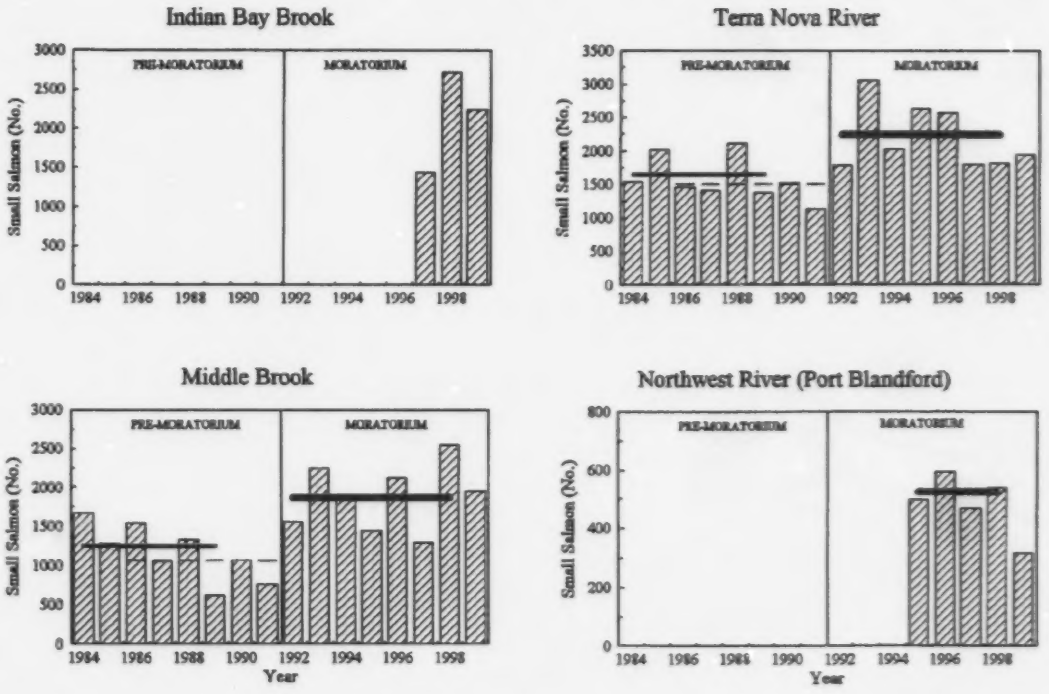

Fig. 11. Total returns of small salmon to Indian Bay Brook, Middle Brook, Terra Nova River and Northwest River (SFA 5), 1984-99. The thin solid horizontal line represents the 1984-89 mean, the broken line the 1986-91 mean, and the thick solid line the 1992-98 mean.

Salmon Fishing Area 5
Total Returns - Large Salmon

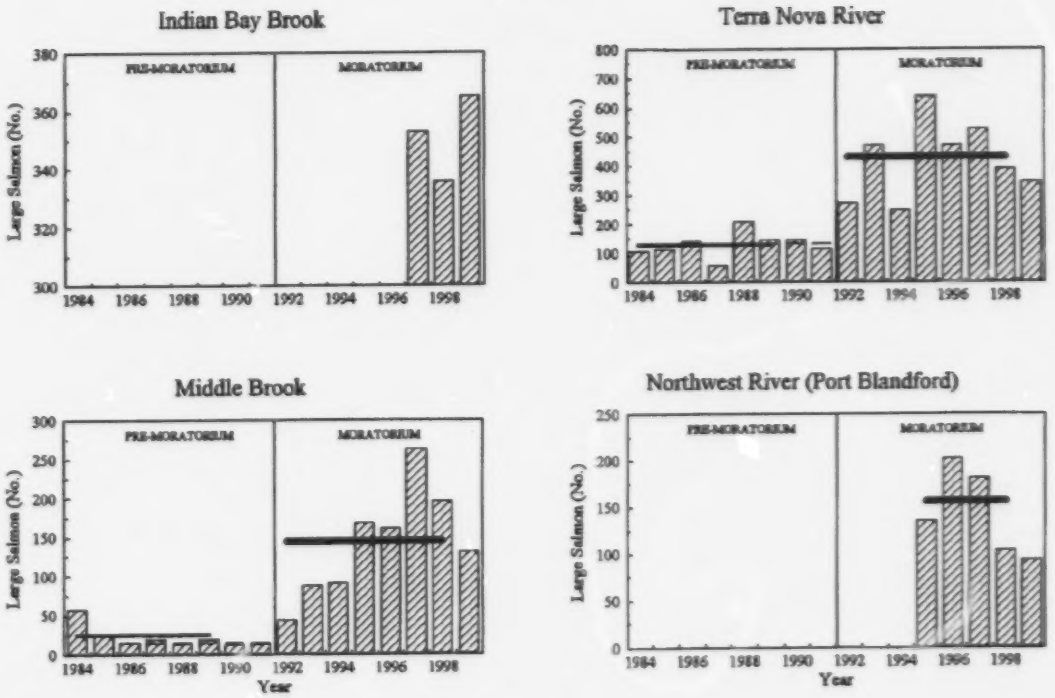

Fig. 12. Total returns of large salmon to Indian Bay Brook, Middle Brook, Terra Nova River and Northwest River (SFA 5), 1984-99. The thin solid horizontal line represents the 1984-89 mean, the broken line the 1986-91 mean, and the thick solid line the 1992-98 mean.

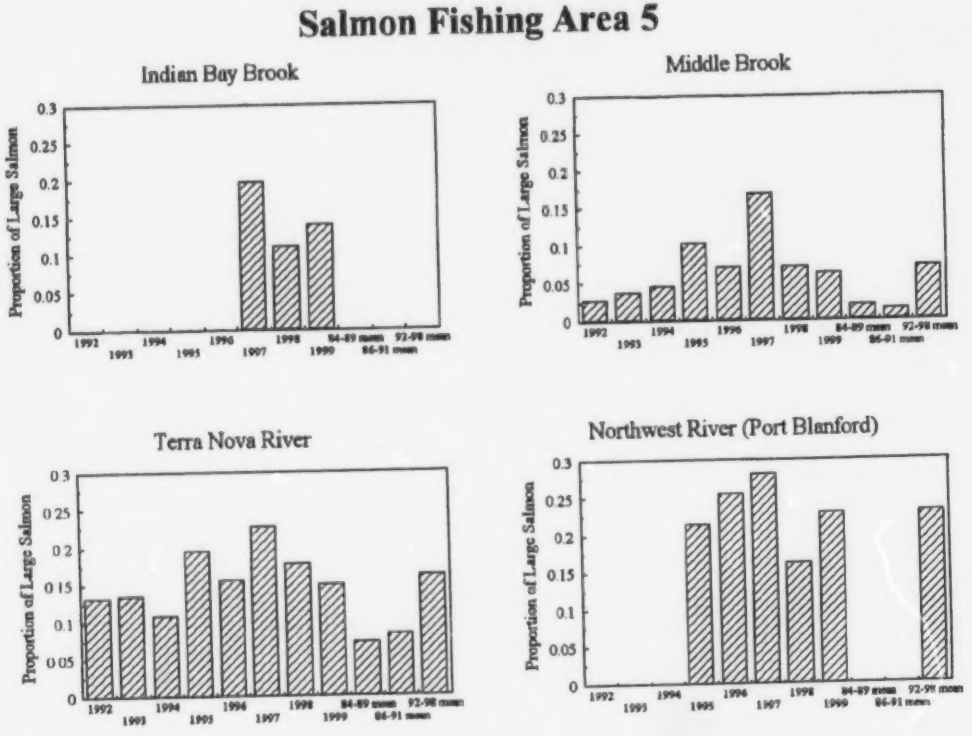

Fig. 13. Proportion of large salmon in total returns for Indian Bay Brook, Middle Brook, Terra Nova River and Northwest River (Port Blandford), SFA 5, 1992-99, and the 1984-89, 1986-91 and 1992-98 means.

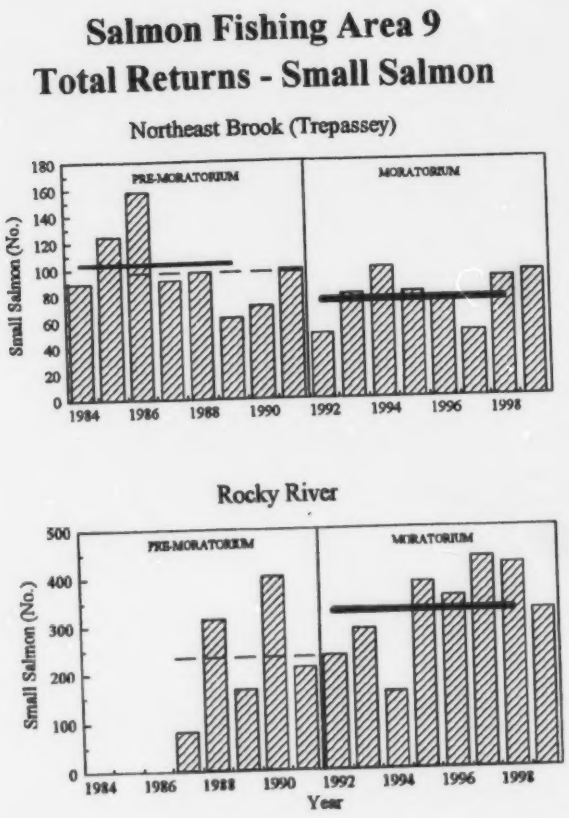

Fig. 14. Total returns of small salmon to Northeast Brook (Trepassey) and Rocky River (SFA 9), 1984-99. The thin solid horizontal line represents the 1984-89 mean, the broken line the 1986-91 mean, and the thick solid line the 1992-98 mean.

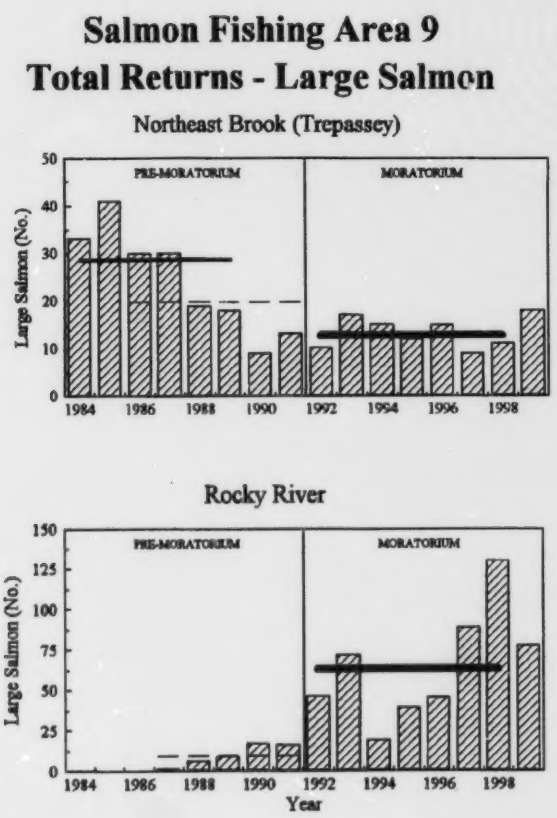

Fig. 15. Total returns of large salmon to Northeast Brook (Trepassey) and Rocky River (SFA 9), 1984-99. The thin solid horizontal line represents the 1984-89 mean, the broken line the 1986-91 mean, and the thick solid line the 1992-98 mean.

Salmon Fishing Area 9

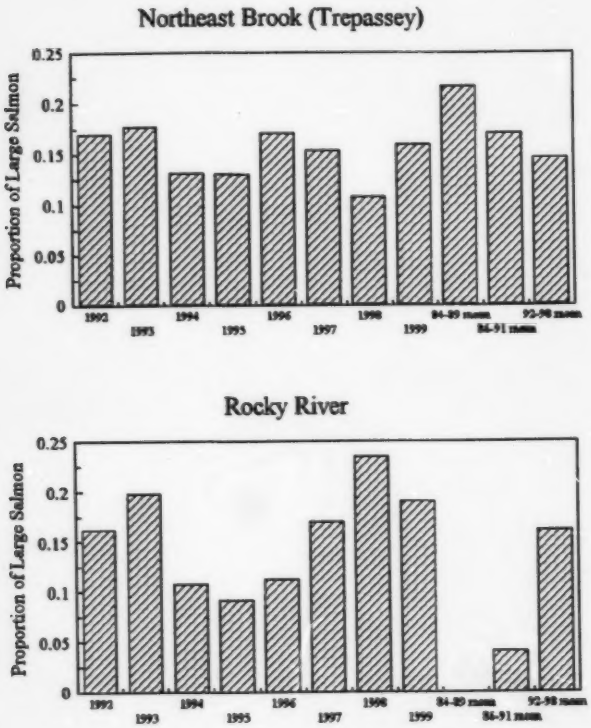

Fig. 16. Proportion of large salmon in total returns for Northeast Brook (Trepassey and Rocky River, SFA 9, 1992-99, and the 1984-89, 1986-91 and 1992-98 means.

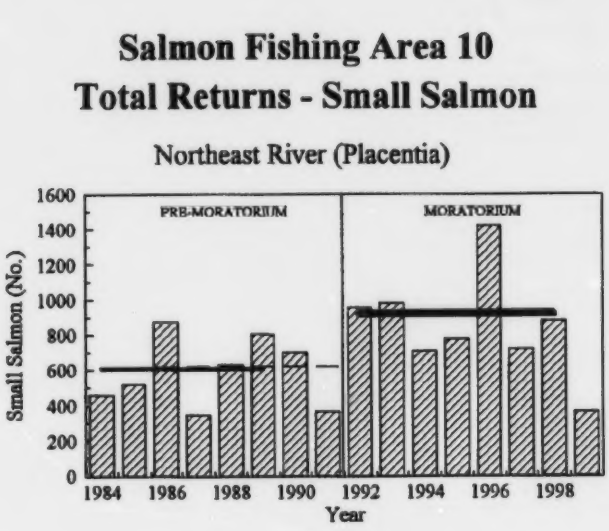

Fig. 17. Total returns of small salmon to Northeast River, Placentia (SFA 10), 1984-99. The thin solid horizontal line represents the 1984-89 mean, the broken line the 1986-91 mean, and the thick solid line the 1992-98 mean.

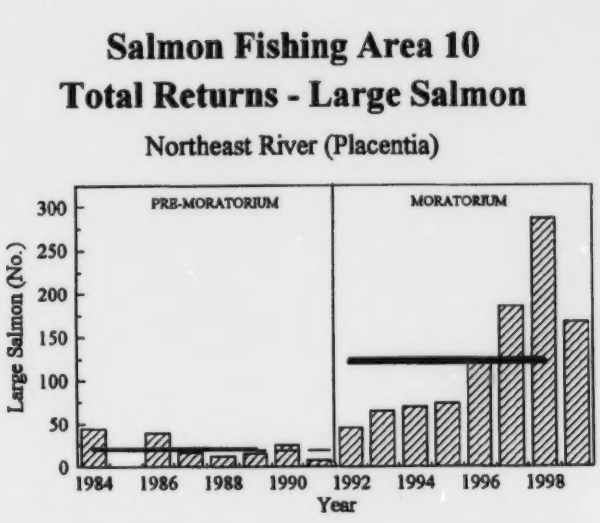

Fig. 18. Total returns of Large salmon to Northeast River, Placentia (SFA 10), 1984-99. The thin solid horizontal line represents the 1984-89 mean, the broken line the 1986-91 mean, and the thick solid line the 1992-98 mean.

Salmon Fishing Area 10

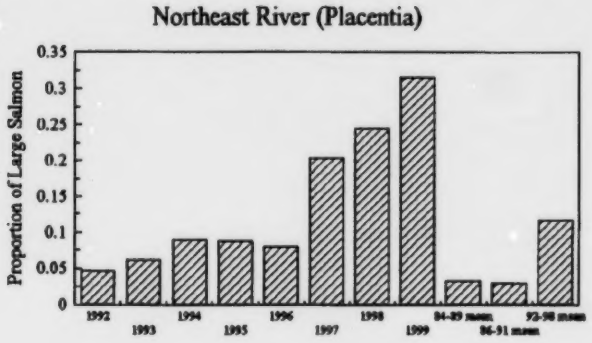

Fig. 19. Proportion of large salmon in total returns for Northeast River (Placentia), SFA 10, 1992-99, and the 1984-89, 1986-91 and 1992-98 means.

Salmon Fishing Area 11
Total Returns - Small Salmon

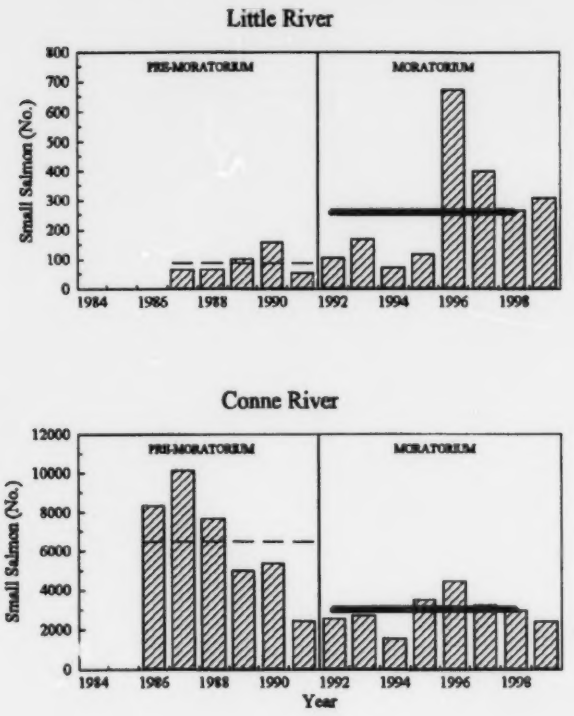

Fig. 20. Total returns of small salmon to Little River and Conne River (SFA 11), 1984-99. The broken line represents the 1986-91 mean, and the solid line the 1992-98 mean.

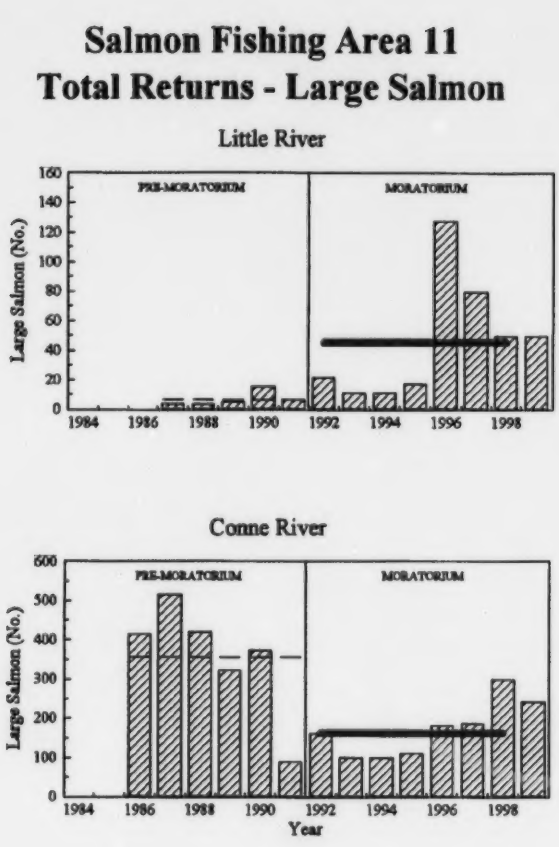

Fig. 21. Total returns of large salmon to Little River and Conne River (SFA 11), 1984-99. The broken line represents the 1986-91 mean, and the solid line the 1992-98 mean.

Salmon Fishing Area 11

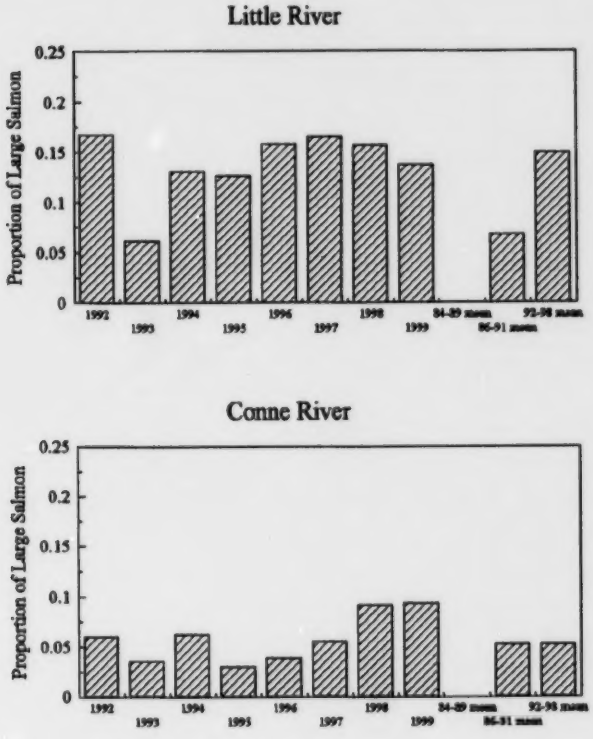

Fig. 22. Proportion of large salmon in total returns for Little River and Conne River, SFA 11, 1992-99, and the 1984-89, 1986-91 and 1992-98 means.

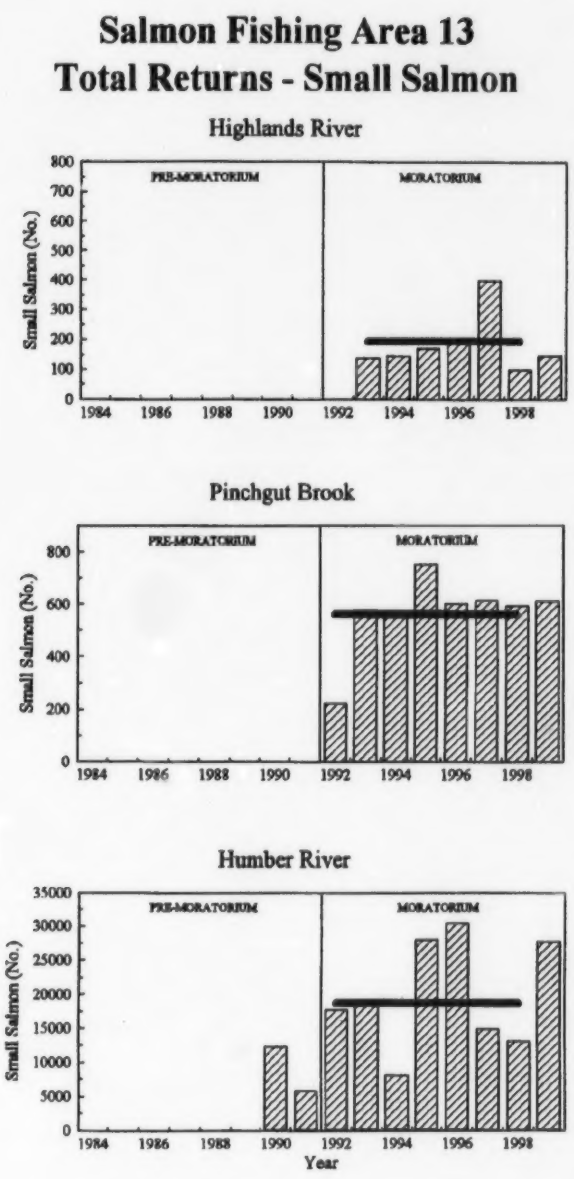

Fig. 23. Total returns of small salmon to Highlands River, Pinchgut Brook and Humber River (SFA 13), 1984-99. The thick solid horizontal line represents the 1992-98 mean.

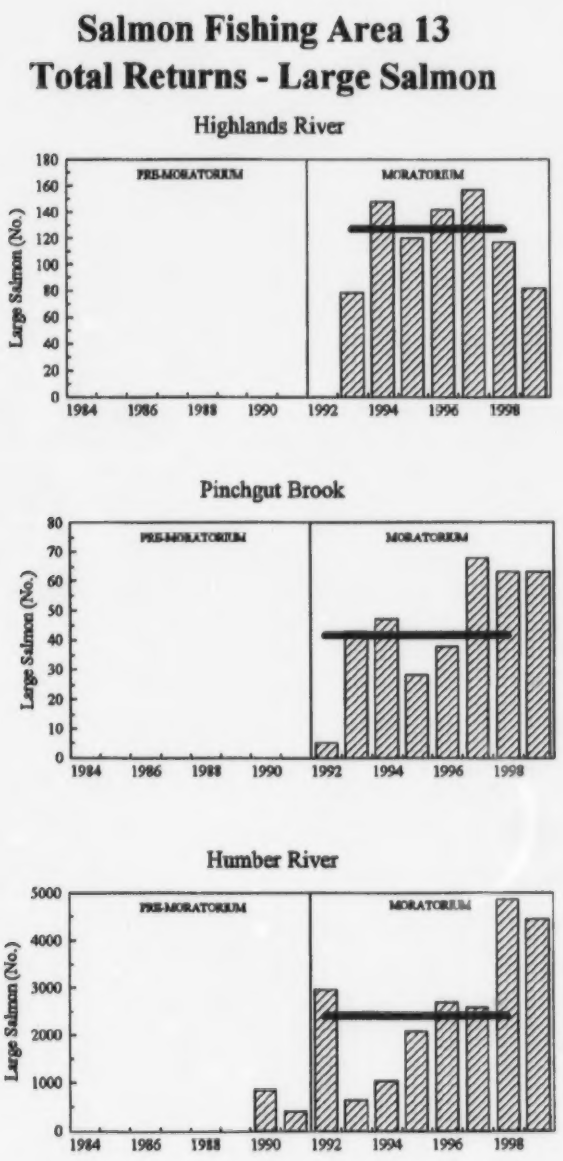

Fig. 24. Total returns of large salmon to Highlands River, Pinchgut Brook and Humber River (SFA 13), 1984-99. The thick solid horizontal line represents the 1992-98 mean.

Salmon Fishing Area 13

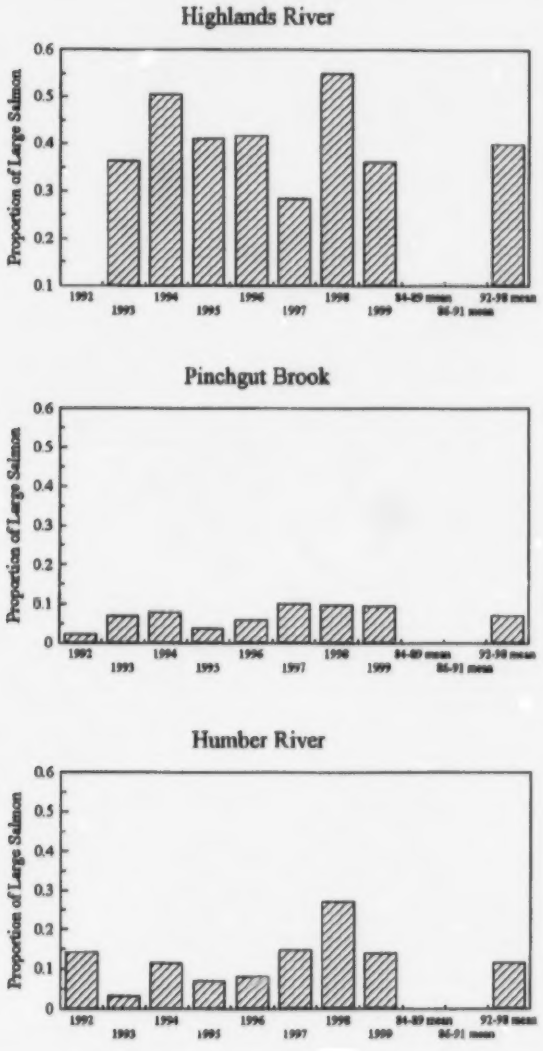

Fig. 25. Proportion of large salmon in total returns for Highlands River, Pinchgut Brook and Humber River, SFA 13, 1992-99, and the 1984-89, 1986-91 and 1992-98 means.

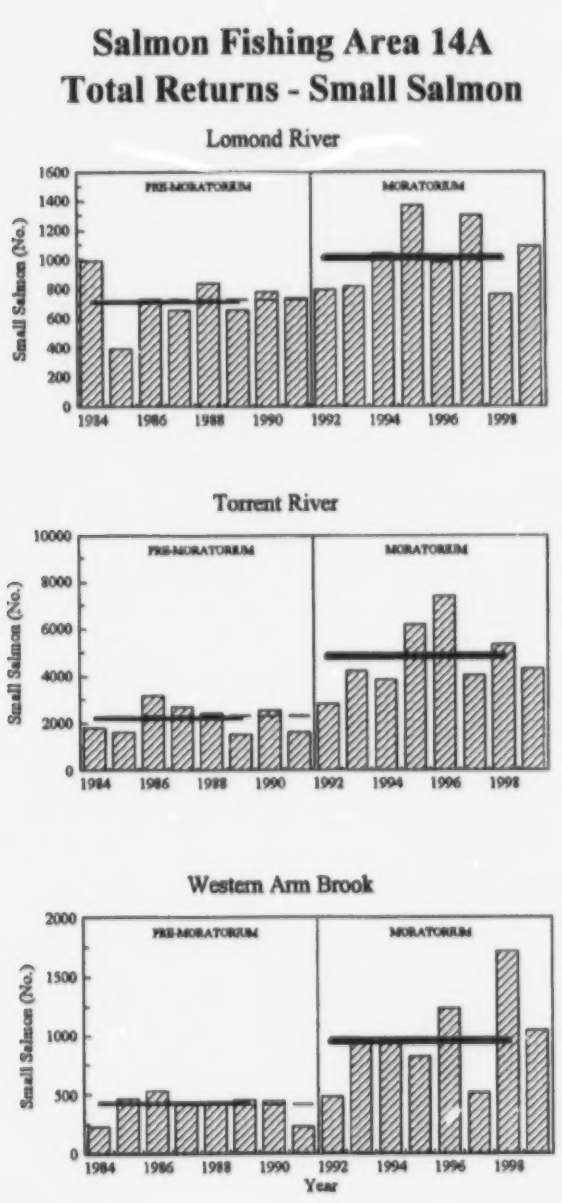

Fig. 26. Total returns of small salmon to Lomond River, Torrent River and Western Arm Brook (SFA 14A), 1984-99. The thin solid horizontal line represents the 1984-89 mean, the broken line the 1986-91 mean, and the thick solid line the 1992-98 mean.

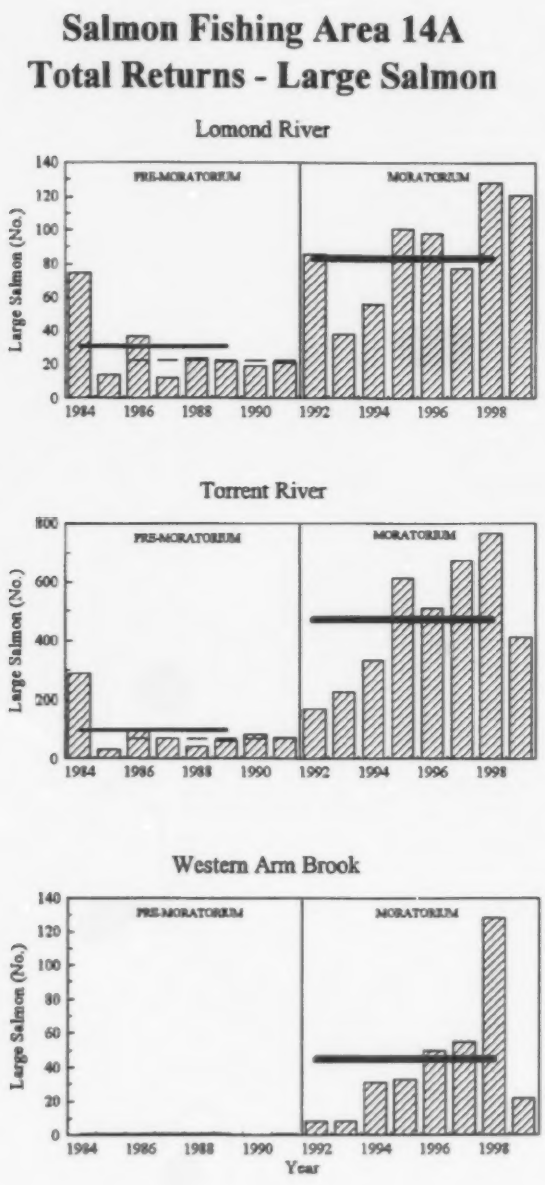

Fig. 27. Total returns of large salmon to Lomond River, Torrent River and Western Arm Brook (SFA 14A), 1984-99. The thin solid horizontal line represents the 1984-89 mean, the broken line the 1986-91 mean, and the thick solid line the 1992-98 mean.

Salmon Fishing Area 14A

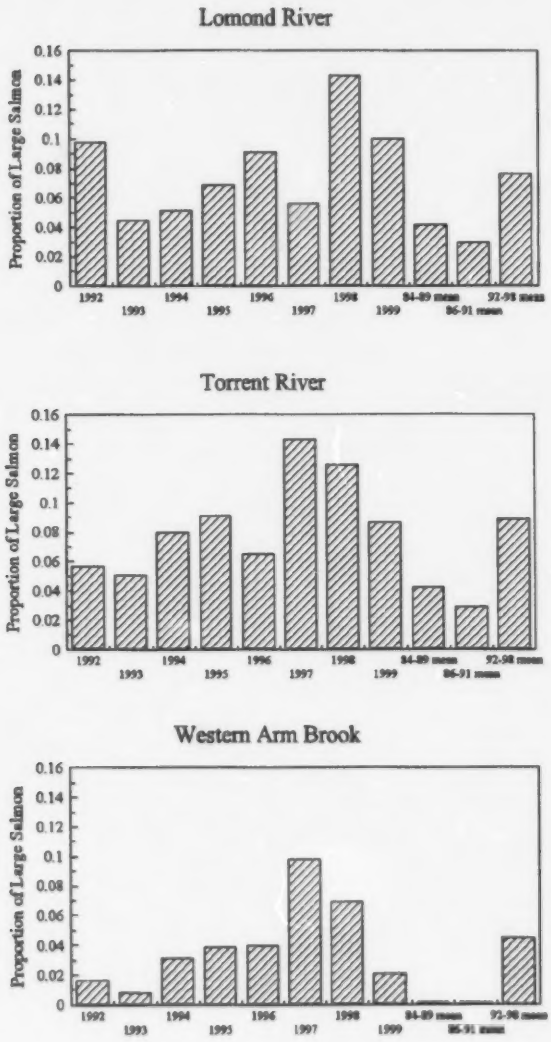

Fig. 28. Proportion of large salmon in total returns for Lomond River, Torrent River and Western Arm Brook, SFA 14A, 1992-99, and the 1984-89, 1986-91 and 1992-98 means.

Appendix 1a. Atlantic salmon recreational fishery catch and effort data for insular Newfoundland (SFAs 3 - 14A), 1974-99. Ret. = retained fish; Rel. = released fish.

	Effort	Small (<63 cm)			Large (>=63 cm)			Total (Small + Large)			
Year	Rod Days	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	CPUE
1974	108199	26485	.	26485	1213	.	1213	27698	.	27698	0.26
1975	102907	33390	.	33390	1241	.	1241	34631	.	34631	0.34
1976	115847	34463	.	34463	1051	.	1051	35514	.	35514	0.31
1977	111836	34352	.	34352	2755	.	2755	37107	.	37107	0.33
1978	96659	28619	.	28619	1563	.	1563	30182	.	30182	0.31
1979	82578	31169	.	31169	561	.	561	31730	.	31730	0.38
1980	104332	35849	.	35849	1922	.	1922	37771	.	37771	0.36
1981	122476	46670	.	46670	1369	.	1369	48039	.	48039	0.39
1982	129369	41871	.	41871	1248	.	1248	43119	.	43119	0.33
1983	126308	32420	.	32420	1382	.	1382	33802	.	33802	0.27
1984	121979	39331	.	39331	511	.	511	39842	.	39842	0.33
1985	120030	36552	.	36552	*	315	315	36552	315	36867	0.31
1986	123528	37496	.	37496	*	798	798	37496	798	38294	0.31
1987	85969	24482	.	24482	*	410	410	24482	410	24892	0.29
1988	120497	39841	.	39841	*	600	600	39841	600	40441	0.34
1989	91286	18462	.	18462	*	183	183	18462	183	18645	0.20
1990	105736	29967	.	29967	*	503	503	29967	503	30470	0.29
1991	89812	20529	.	20529	*	336	336	20529	336	20865	0.23
1992	95931	23118	5642	28760	*	1413	1413	23118	7055	30173	0.31
1993	125661	24693	16403	41096	*	1640	1640	24693	18043	42736	0.34
1994	141508	28959	8370	37329	*	2052	2052	28959	10422	39381	0.28
1995	143275	29055	9575	38630	*	2188	2188	29055	11763	40818	0.28
1996***		36715	18603	55318	*	2639	2639	36715	21242	57957	
1997**		17388	15456	32844	*	3332	3332	17388	18788	36176	
1998**		19672	21476	41148	*	3597	3597	19672	25073	44745	
1999**		14937	9138	24075	*	2831	2831	14937	11969	26906	
84-89 $\bar{X}$	115464.0	34336.4	.	34336.4	.	474.0	481.4	34438.6	474.0	34817.8	0.30
95% CL	16865.5	11141.0	.	11141.0	.	441.3	298.9	11232.5	441.3	11356.3	0.06
N	5	5	0	5	0	4	5	5	4	5	5
86-91 $\bar{X}$	106171.8	29259.0	.	29259.0	.	484.0	484.0	29259.0	484.0	29743.0	0.28
95% CL	19588.7	11990.2	.	11990.2	.	294.4	294.4	11990.2	294.4	12259.7	0.07
N	5	5	0	5	0	5	5	5	5	5	5
92-96 $\bar{X}$	126593.8	28508.0	11718.6	40226.6	.	1986.4	1986.4	28508.0	13705.0	42213.0	0.33
95% CL	34878.5	6553.5	6858.2	11955.1	.	595.3	595.3	6553.5	7196.1	12462.3	0.08
N	4	5	5	5	0	5	5	5	5	5	4

1987 DATA NOT INCLUDED IN MEAN.

IN THE ABOVE TABLE A PERIOD INDICATES NO DATA FOR THAT YEAR.

CPUE IS BASED ON RETAINED + RELEASED FISH FOR 1985-95 AND ON RETAINED FISH ONLY PRIOR TO 1985.

* NOT ALLOWED TO RETAIN LARGE SALMON IN INSULAR NEWFOUNDLAND.

**DATA WERE OBTAINED FROM THE LICENSE STUB RETURN (1999 DATA ARE PRELIMINARY).

***DATA WERE UNAVAILABLE FOR SOME RIVERS IN INS. NEWFOUNDLAND (SFAs 12 & 13) IN 1996, THEREFORE LICENSE STUB DATA WERE USED.

Appendix 1b. Atlantic salmon recreational fishery catch and effort data for Northern Peninsula East & Eastern (SFAs 3 - 8), 1974-99. Ret. = retained fish; Rel. = released fish.

	Effort	Small (<63 cm)			Large (>=63 cm)			Total (Small + Large)			
Year	Rod Days	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	CPUE
1974	38626	8336	.	8336	110	.	110	8446	.	8446	0.22
1975	35673	9259	.	9259	190	.	190	9449	.	9449	0.26
1976	38552	9885	.	9885	256	.	256	10141	.	10141	0.26
1977	45112	15102	.	15102	1154	.	1154	16256	.	16256	0.36
1978	39561	12829	.	12829	539	.	539	13368	.	13368	0.34
1979	31365	11866	.	11866	349	.	349	12215	.	12215	0.39
1980	40581	14401	.	14401	588	.	588	14989	.	14989	0.37
1981	49396	20187	.	20187	430	.	430	20617	.	20617	0.42
1982	51961	15568	.	15568	435	.	435	16003	.	16003	0.31
1983	46821	13404	.	13404	518	.	518	13922	.	13922	0.30
1984	49240	14091	.	14091	25	.	25	14116	.	14116	0.29
1985	52799	17628	.	17628	*	.	.	17628	.	17628	0.33
1986	48582	14803	.	14803	*	.	.	14803	.	14803	0.30
1987	27158	7888	.	7888	*	.	.	7888	.	7888	0.29
1988	46400	16412	.	16412	*	.	.	16412	.	16412	0.35
1989	30571	6352	.	6352	*	.	.	6352	.	6352	0.21
1990	38956	10262	.	10262	*	.	.	10262	.	10262	0.26
1991	35084	8489	.	8489	*	.	.	8489	.	8489	0.24
1992	36254	9063	2373	11436	*	11	11	9063	2384	11447	0.32
1993	52640	9729	11911	21640	*	426	426	9729	12337	22066	0.42
1994	72813	16250	5283	21533	*	539	539	16250	5822	22072	0.30
1995	63184	12823	4738	17561	*	421	421	12823	5159	17982	0.28
1996	71615	17555	8244	25799	*	505	505	17555	8749	26304	0.37
1997**		5934	4171	10105	*	521	521	5934	4692	10626	
1998**		10783	11213	21996	*	1007	1007	10783	12220	23003	
1999**		7589	3829	11418	*	722	722	7589	4551	12140	
84-89 $\bar{X}$	45518.4	13857.2	.	13857.2	.	.	.	13862.2	.	13862.2	0.30
95% CL	10759.4	5483.0	.	5483.0	.	.	.	5483.4	.	5483.4	0.06
N	5	5	0	5	0	0	0	5	0	5	5
86-91 $\bar{X}$	39918.6	11263.6	.	11263.6	.	.	.	11263.6	.	11263.6	0.28
95% CL	9388.1	5261.9	.	5261.9	.	.	.	5261.9	.	5261.9	0.07
N	5	5	0	5	0	0	0	5	0	5	5
92-96 $\bar{X}$	59301.2	13084.0	6509.8	19593.8	.	380.4	380.4	13084.0	6890.2	19974.2	0.34
95% CL	18877.0	4707.2	4558.8	6718.1	.	264.0	264.0	4707.2	4709.7	6954.6	0.07
N	5	5	5	5	0	5	5	5	5	5	5

1987 DATA NOT INCLUDED IN MEAN.

IN THE ABOVE TABLE A PERIOD INDICATES NO DATA FOR THAT YEAR

CPUE IS BASED ON RETAINED + RELEASED FISH FOR 1992-96 AND ON RETAINED FISH ONLY PRIOR TO 1992.

* NOT ALLOWED TO RETAIN LARGE SALMON IN INSULAR NEWFOUNDLAND.

**DATA WERE OBTAINED FROM THE LICENSE STUB RETURN (1999 DATA ARE PRELIMINARY).

Appendix 1c. Atlantic salmon recreational fishery catch and effort data for South (SFAs 9 - 11), 1974-99. Ret. = retained fish; Rel. = released fish.

	Effort	Small (<63 cm)			Large (>=63 cm)			Total (Small + Large)			
Year	Rod Days	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	CPUE
1974	29268	7182	.	7182	61	.	61	7243	.	7243	0.25
1975	24518	6800	.	6800	55	.	55	6855	.	6855	0.28
1976	26301	6517	.	6517	64	.	64	6581	.	6581	0.25
1977	23945	6273	.	6273	32	.	32	6305	.	6305	0.26
1978	24038	6894	.	6894	77	.	77	6971	.	6971	0.29
1979	18834	5983	.	5983	30	.	30	6013	.	6013	0.32
1980	26044	8972	.	8972	132	.	132	9104	.	9104	0.35
1981	28488	10241	.	10241	122	.	122	10363	.	10363	0.36
1982	33239	10419	.	10419	96	.	96	10515	.	10515	0.32
1983	35346	8212	.	8212	177	.	177	8389	.	8389	0.24
1984	30500	10740	.	10740	22	.	22	10762	.	10762	0.35
1985	29984	8899	.	8899	*	.	.	8899	.	8899	0.30
1986	30427	9379	.	9379	*	.	.	9379	.	9379	0.31
1987	20651	5125	.	5125	*	.	.	5125	.	5125	0.25
1988	27166	7548	.	7548	*	.	.	7548	.	7548	0.28
1989	23291	5173	.	5173	*	.	.	5173	.	5173	0.22
1990	25538	7147	.	7147	*	.	.	7147	.	7147	0.28
1991	17089	2643	.	2643	*	.	.	2643	.	2643	0.15
1992	18100	3208	1732	4940	*	8	8	3208	1740	4948	0.27
1993	29280	5215	1506	6721	*	84	84	5215	1590	6805	0.23
1994	25073	4055	917	4972	*	61	61	4055	978	5033	0.20
1995	35146	6299	1499	7798	*	47	47	6299	1546	7845	0.22
1996	41628	7498	2425	9923	*	139	139	7498	2564	10062	0.24
1997**		3521	2732	6253	*	264	264	3521	2996	6517	
1998**		2563	2391	4954	*	319	319	2563	2710	5273	
1999**		1819	1571	3390	*	243	243	1819	1814	3633	
84-89 $\bar{X}$	28273.6	8347.8	.	8347.8	.	.	.	8352.2	.	8352.2	0.30
95% CL	3855.2	2619.5	.	2619.5	.	.	.	2627.3	.	2627.3	0.06
N	5	5	0	5	0	0	0	5	0	5	5
86-91 $\bar{X}$	24702.2	6378.0	.	6378.0	.	.	.	6378.0	.	6378.0	0.26
95% CL	6191.6	3187.5	.	3187.5	.	.	.	3187.5	.	3187.5	0.07
N	5	5	0	5	0	0	0	5	0	5	5
92-96 $\bar{X}$	29845.4	5255.0	1615.8	6870.8	.	67.8	67.8	5255.0	1683.6	6938.6	0.23
95% CL	11241.5	2128.0	675.0	2599.0	.	60.1	60.1	2128.0	708.8	2647.3	0.02
N	5	5	5	5	0	5	5	5	5	5	5

1987 DATA NOT INCLUDED IN MEAN.

IN THE ABOVE TABLE A PERIOD INDICATES NO DATA FOR THAT YEAR.

CPUE IS BASED ON RETAINED + RELEASED FISH FOR 1992-96 AND ON RETAINED FISH ONLY PRIOR TO 1992.

* NOT ALLOWED TO RETAIN LARGE SALMON IN INSULAR NEWFOUNDLAND.

**DATA WERE OBTAINED FROM THE LICENSE STUB RETURN (1999 DATA ARE PRELIMINARY).

Appendix 1d. Atlantic salmon recreational fishery catch and effort data for Southwest (SFAs 12 & 13), 1974-99. Ret. = retained fish; Rel. = released fish.

	Effort	Small (<63 cm)			Large (>=63 cm)			Total (Small + Large)			
Year	Rod Days	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	CPUE
1974	30736	7847	.	7847	929	.	929	8776	.	8776	0.29
1975	33457	12513	.	12513	906	.	906	13419	.	13419	0.40
1976	33848	10680	.	10680	631	.	631	11311	.	11311	0.33
1977	25712	7270	.	7270	1097	.	1097	8367	.	8367	0.33
1978	20991	5655	.	5655	875	.	875	6530	.	6530	0.31
1979	18094	6742	.	6742	123	.	123	6865	.	6865	0.38
1980	23488	8733	.	8733	1022	.	1022	9755	.	9755	0.42
1981	25874	10360	.	10360	680	.	680	11040	.	11040	0.43
1982	28056	11121	.	11121	610	.	610	11731	.	11731	0.42
1983	28121	7004	.	7004	618	.	618	7622	.	7622	0.27
1984	25742	9693	.	9693	377	.	377	10070	.	10070	0.39
1985	23859	6399	.	6399	*	287	287	6399	287	6686	0.28
1986	29137	8284	.	8284	*	696	696	8284	696	8980	0.31
1987	23099	6849	.	6849	*	369	369	6849	369	7218	0.31
1988	27963	9630	.	9630	*	429	429	9630	429	10059	0.36
1989	21201	3734	.	3734	*	139	139	3734	139	3873	0.18
1990	24829	7508	.	7508	*	367	367	7508	367	7875	0.32
1991	23789	5832	.	5832	*	219	219	5832	219	6051	0.25
1992	24460	6069	1006	7075	*	1025	1025	6069	2031	8100	0.33
1993	25883	5844	984	6828	*	754	754	5844	1738	7582	0.29
1994	22576	4225	1073	5298	*	977	977	4225	2050	6275	0.28
1995	20786	3843	1251	5094	*	989	989	3843	2240	6083	0.29
1996***		5177	4926	10103	*	1289	1289	5177	6215	11392	
1997**		4419	6731	11150	*	2130	2130	4419	8861	13280	
1998**		2718	4399	7117	*	1802	1802	2718	6201	8919	
1999**		3066	2266	5332	*	1280	1280	3066	3546	6612	
84-89 $\bar{X}$	25166.8	7431.5	.	7431.5	.	384.0	382.8	7494.3	384.0	7814.3	0.31
95% CL	3170.6	2382.0	.	2382.0	.	255.2	193.0	2464.9	255.2	2512.4	0.07
N	6	6	0	6	0	5	6	6	5	6	6
86-91 $\bar{X}$	25003.0	6972.8	.	6972.8	.	369.8	369.8	6972.8	369.8	7342.7	0.29
95% CL	3164.0	2144.5	.	2144.5	.	202.4	202.4	2144.5	202.4	2302.7	0.06
N	6	6	0	6	0	6	6	6	6	6	6
92-96 $\bar{X}$	23426.3	5031.6	1848.0	6879.6	.	1006.8	1006.8	5031.6	2854.8	7886.4	0.34
95% CL	3533.6	1213.3	2140.1	2492.3	.	236.4	236.4	1213.3	2342.6	2653.7	0.08
N	4	5	5	5	0	5	5	5	5	5	4

IN THE ABOVE TABLE A PERIOD INDICATES NO DATA FOR THAT YEAR.

CPUE IS BASED ON RETAINED + RELEASED FISH FOR 1985-95 AND ON RETAINED FISH ONLY PRIOR TO 1985.

**DATA WERE OBTAINED FROM THE LICENSE STUB RETURN (1999 DATA ARE PRELIMINARY).

***FOR RIVERS WHERE DFO DATA WERE UNAVAILABLE LICENSE STUB RETURN DATA WERE USED.

Appendix 1e. Atlantic salmon recreational fishery catch and effort data for the Northern Peninsula West (SFA 14A), 1974-99. Ret. = retained fish; Rel. = released fish.

	Effort	Small (<63 cm)			Large (>=63 cm)			Total (Small + Large)			
Year	Rod Days	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	CPUE
1974	9569	3120	.	3120	113	.	113	3233	.	3233	0.34
1975	9259	4818	.	4818	90	.	90	4908	.	4908	0.53
1976	17146	7381	.	7381	100	.	100	7481	.	7481	0.44
1977	17067	5707	.	5707	472	.	472	6179	.	6179	0.36
1978	12069	3241	.	3241	72	.	72	3313	.	3313	0.27
1979	14285	6578	.	6578	59	.	59	6637	.	6637	0.46
1980	14219	3743	.	3743	180	.	180	3923	.	3923	0.28
1981	18718	5882	.	5882	137	.	137	6019	.	6019	0.32
1982	16113	4763	.	4763	107	.	107	4870	.	4870	0.30
1983	16020	3800	.	3800	69	.	69	3869	.	3869	0.24
1984	16497	4807	.	4807	87	.	87	4894	.	4894	0.30
1985	13388	3626	.	3626	*	28	28	3626	28	3654	0.27
1986	15382	5030	.	5030	*	102	102	5030	102	5132	0.33
1987	15061	4620	.	4620	*	41	41	4620	41	4661	0.31
1988	18968	6251	.	6251	*	171	171	6251	171	6422	0.34
1989	16223	3203	.	3203	*	44	44	3203	44	3247	0.20
1990	16413	5050	.	5050	*	136	136	5050	136	5186	0.32
1991	13850	3565	.	3565	*	117	117	3565	117	3682	0.27
1992	17117	4778	531	5309	*	369	369	4778	900	5678	0.33
1993	17858	3905	2002	5907	*	376	376	3905	2378	6283	0.35
1994	21046	4429	1097	5526	*	475	475	4429	1572	6001	0.29
1995	24159	6090	2087	8177	*	731	731	6090	2818	8908	0.37
1996	25876	6485	3008	9493	*	706	706	6485	3714	10199	0.39
1997**		3514	1822	5336	*	417	417	3514	2239	5753	
1998**		3608	3473	7081	*	469	469	3608	3942	7550	
1999**		2463	1472	3935	*	586	586	2463	2058	4521	
84-89 $\bar{X}$	15919.8	4589.5	.	4589.5	.	77.2	78.8	4604.0	77.2	4668.3	0.29
95% CL	1944.1	1135.7	.	1135.7	.	74.1	56.2	1139.9	74.1	1186.6	0.06
N	6	6	0	6	0	5	6	6	5	6	6
86-91 $\bar{X}$	15982.8	4619.8	.	4619.8	.	101.8	101.8	4619.8	101.8	4721.7	0.30
95% CL	1812.7	1162.6	.	1162.6	.	54.0	54.0	1162.6	54.0	1199.9	0.06
N	6	6	0	6	0	6	6	6	6	6	6
92-96 $\bar{X}$	21211.2	5137.4	1745.0	6882.4	.	531.4	531.4	5137.4	2276.4	7413.8	0.35
95% CL	4747.0	1370.3	1189.5	2302.4	.	218.6	218.6	1370.3	1354.4	2504.4	0.05
N	5	5	5	5	0	5	5	5	5	5	5

IN THE ABOVE TABLE A PERIOD INDICATES NO DATA FOR THAT YEAR.
CPUE IS BASED ON RETAINED + RELEASED FISH FOR 1985-96 AND ON RETAINED FISH ONLY PRIOR TO 1985.
**DATA WERE OBTAINED FROM THE LICENSE STUB RETURN (1999 DATA ARE PRELIMINARY).

Appendix 1f. Atlantic salmon recreational fishery catch and effort data for Salmon Fishing Area 3, insular Newfoundland, 1974-99. Ret. = retained fish; Rel. = released fish.

	Effort	Small (<63 cm)			Large (>= 63 cm)			Total (Small + Large)			
Year	Rod Days	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	CPUE
1974	1890	839	.	839	4	.	4	843	.	843	0.45
1975	1948	1107	.	1107	0	.	0	1107	.	1107	0.57
1976	2284	947	.	947	1	.	1	948	.	948	0.42
1977	2249	1530	.	1530	4	.	4	1534	.	1534	0.68
1978	2030	758	.	758	1	.	1	759	.	759	0.37
1979	2514	2040	.	2040	0	.	0	2040	.	2040	0.81
1980	2585	1743	.	1743	37	.	37	1780	.	1780	0.69
1981	3113	2358	.	2358	3	.	3	2361	.	2361	0.76
1982	3907	2634	.	2634	88	.	88	2722	.	2722	0.70
1983	4075	1617	.	1617	2	.	2	1619	.	1619	0.40
1984	2248	1001	.	1001	0	.	0	1001	.	1001	0.45
1985	2355	1310	.	1310	*	.	.	1310	.	1310	0.56
1986	1430	772	.	772	*	.	.	772	.	772	0.54
1987	1121	563	.	563	*	.	.	563	.	563	0.50
1988	2979	1756	.	1756	*	.	.	1756	.	1756	0.59
1989	1672	738	.	738	*	.	.	738	.	738	0.44
1990	3159	1718	.	1718	*	.	.	1718	.	1718	0.54
1991	3495	1316	.	1316	*	.	.	1316	.	1316	0.38
1992	3961	1562	120	1682	*	5	5	1562	125	1687	0.43
1993	4384	1480	2585	4065	*	152	152	1480	2737	4217	0.96
1994	7715	3314	1844	5158	*	404	404	3314	2248	5562	0.72
1995	5438	1405	890	2295	*	186	186	1405	1076	2481	0.46
1996	6363	2122	1118	3240	*	143	143	2122	1261	3383	0.53
1997**		1632	1296	2928	*	132	132	1632	1428	3060	
1998**		2633	2750	5383	*	144	144	2633	2894	5527	
1999**		1421	1053	2474	*	128	128	1421	1181	2602	
84-89 $\bar{X}$	2136.8	1115.4	.	1115.4	.	.	.	1115.4	.	1115.4	0.52
95% CL	756.4	527.3	.	527.3	.	.	.	527.3	.	527.3	0.09
N	5	5	0	5	0	0	0	5	0	5	5
86-91 $\bar{X}$	2547.0	1260.0	.	1260.0	.	.	.	1260.0	.	1260.0	0.49
95% CL	1156.8	611.2	.	611.2	.	.	.	611.2	.	611.2	0.13
N	5	5	0	5	0	0	0	5	0	5	5
92-96 $\bar{X}$	5572.2	1976.6	1311.4	3288.0	0.0	178.0	178.0	1976.6	1489.4	3466.0	0.62
95% CL	1887.1	992.2	1167.9	1718.9	0.0	178.8	178.8	992.2	1274.6	1872.4	0.24
N	5	5	5	5	5	5	5	5	5	5	5

1987 DATA NOT INCLUDED IN MEAN.

IN THE ABOVE TABLE A PERIOD INDICATES NO DATA FOR THAT YEAR.

CPUE IS BASED ON RETAINED + RELEASED FISH FOR 1992-96 AND ON RETAINED FISH ONLY PRIOR TO 1992.

* NOT ALLOWED TO RETAIN LARGE SALMON IN INSULAR NEWFOUNDLAND.

**DATA OBTAINED FROM THE LICENSE STUB RETURN (1999 DATA ARE PRELIMINARY).

Appendix 1g. Atlantic salmon recreational fishery catch and effort data for Salmon Fishing Area 4, insular Newfoundland, 1974-99. Ret. = retained fish; Rel. = released fish.

	Effort	Small (<63 cm)			Large (>= 63 cm)			Total (Small + Large)			
Year	Rod Days	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	CPUE
1974	22038	5373	.	5373	82	.	82	5455	.	5455	0.25
1975	22384	5943	.	5943	166	.	166	6109	.	6109	0.27
1976	24787	6683	.	6683	188	.	188	6871	.	6871	0.28
1977	28117	8396	.	8396	1086	.	1086	9482	.	9482	0.34
1978	24131	8774	.	8774	502	.	502	9276	.	9276	0.38
1979	21496	8026	.	8026	327	.	327	8353	.	8353	0.39
1980	25172	9414	.	9414	507	.	507	9921	.	9921	0.39
1981	32282	13536	.	13536	361	.	361	13897	.	13897	0.43
1982	32929	9973	.	9973	258	.	258	10231	.	10231	0.31
1983	26649	8954	.	8954	297	.	297	9251	.	9251	0.35
1984	29633	9900	.	9900	15	.	15	9915	.	9915	0.33
1985	34329	12190	.	12190	*	.	.	12190	.	12190	0.36
1986	31650	9293	.	9293	*	.	.	9293	.	9293	0.29
1987	18564	5453	.	5453	*	.	.	5453	.	5453	0.29
1988	27413	9854	.	9854	*	.	.	9854	.	9854	0.36
1989	17767	3786	.	3786	*	.	.	3786	.	3786	0.21
1990	23533	5661	.	5661	*	.	.	5661	.	5661	0.24
1991	21999	4892	.	4892	*	.	.	4892	.	4892	0.22
1992	19485	5290	1515	6805	*	5	5	5290	1520	6810	0.35
1993	30958	5724	7232	12956	*	158	158	5724	7390	13114	0.42
1994	43242	9351	2728	12079	*	79	79	9351	2807	12158	0.28
1995	36717	7979	3199	11178	*	151	151	7979	3350	11329	0.31
1996	44385	10960	6374	17334	*	232	232	10960	6606	17566	0.40
1997**		3353	2461	5814	*	338	338	3353	2799	6152	
1998**		6584	7072	13656	*	686	686	6584	7758	14342	
1999**		5170	2306	7476	*	504	504	5170	2810	7980	
84-89 $\bar{X}$	28158.4	9004.6	.	9004.6	.	.	.	9007.6	.	9007.6	0.32
95% CL	7875.7	3875.8	.	3875.8	.	.	.	3877.2	.	3877.2	0.06
N	5	5	0	5	0	0	0	5	0	5	5
86-91 $\bar{X}$	24472.4	6697.2	.	6697.2	.	.	.	6697.2	.	6697.2	0.27
95% CL	6573.0	3372.1	.	3372.1	.	.	.	3372.1	.	3372.1	0.08
N	5	5	0	5	0	0	0	5	0	5	5
92-96 $\bar{X}$	34957.4	7860.8	4209.6	12070.4	0.0	125.0	125.0	7860.8	4334.6	12195.4	0.35
95% CL	12660.5	2977.9	3059.7	4686.9	0.0	107.0	107.0	2977.9	3148.0	4785.8	0.08
N	5	5	5	5	5	5	5	5	5	5	5

1987 DATA NOT INCLUDED IN MEAN.

IN THE ABOVE TABLE A PERIOD INDICATES NO DATA FOR THAT YEAR.

CPUE IS BASED ON RETAINED + RELEASED FISH FOR 1992-96 AND ON RETAINED FISH ONLY PRIOR TO 1992.

* NOT ALLOWED TO RETAIN LARGE SALMON IN INSULAR NEWFOUNDLAND.

**DATA OBTAINED FROM THE LICENSE STUB RETURN (1999 DATA ARE PRELIMINARY).

Appendix 1h. Atlantic salmon recreational fishery catch and effort data for Salmon Fishing Area 5, insular Newfoundland, 1974-99. Ret. = retained fish; Rel.= released fish.

	Effort	Small (<63 cm)			Large (>= 63 cm)			Total (Small + Large)			
Year	Rod Days	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	CPUE
1974	9335	1637	.	1637	21	.	21	1658	.	1658	0.18
1975	7527	1988	.	1988	23	.	23	2011	.	2011	0.27
1976	6975	1898	.	1898	65	.	65	1963	.	1963	0.28
1977	10572	4616	.	4616	44	.	44	4660	.	4660	0.44
1978	9108	2858	.	2858	28	.	28	2886	.	2886	0.32
1979	3926	1331	.	1331	20	.	20	1351	.	1351	0.34
1980	8155	2702	.	2702	29	.	29	2731	.	2731	0.33
1981	8863	3488	.	3488	35	.	35	3523	.	3523	0.40
1982	9935	2433	.	2433	53	.	53	2486	.	2486	0.25
1983	10195	2357	.	2357	170	.	170	2527	.	2527	0.25
1984	12403	2703	.	2703	1	.	1	2704	.	2704	0.22
1985	11613	3484	.	3484	*	.	.	3484	.	3484	0.30
1986	11510	4053	.	4053	*	.	.	4053	.	4053	0.35
1987	5267	1664	.	1664	*	.	.	1664	.	1664	0.32
1988	10497	4166	.	4166	*	.	.	4166	.	4166	0.40
1989	6617	1417	.	1417	*	.	.	1417	.	1417	0.21
1990	7999	2414	.	2414	*	.	.	2414	.	2414	0.30
1991	7002	2048	.	2048	*	.	.	2048	.	2048	0.29
1992	9230	1941	728	2669	*	1	1	1941	729	2670	0.29
1993	12949	2091	2008	4099	*	107	107	2091	2115	4206	0.32
1994	18000	3216	689	3905	*	52	52	3216	741	3957	0.22
1995	16691	2860	586	3446	*	76	76	2860	662	3522	0.21
1996	16415	3948	706	4654	*	113	113	3948	819	4767	0.29
1997**		898	395	1293	*	46	46	898	441	1339	
1998**		1430	1326	2756	*	167	167	1430	1493	2923	
1999**		934	394	1328	*	84	84	934	478	1412	
84-89 $\bar{X}$	10528.0	3164.6	.	3164.6	.	.	.	3164.8	.	3164.8	0.30
95% CL	2841.4	1410.2	.	1410.2	.	.	.	1410.1	.	1410.1	0.10
N	5	5	0	5	0	0	0	5	0	5	5
86-91 $\bar{X}$	8725.0	2819.6	.	2819.6	.	.	.	2819.6	.	2819.6	0.32
95% CL	2694.0	1528.2	.	1528.2	.	.	.	1528.2	.	1528.2	0.08
N	5	5	0	5	0	0	0	5	0	5	5
92-96 $\bar{X}$	14657.0	2811.2	943.4	3754.6	0.0	69.8	69.8	2811.2	1013.2	3824.4	0.26
95% CL	4423.0	1026.5	741.9	925.7	0.0	56.7	56.7	1026.5	767.8	976.7	0.06
N	5	5	5	5	5	5	5	5	5	5	5

1987 DATA NOT INCLUDED IN MEAN.

IN THE ABOVE TABLE A PERIOD INDICATES NO DATA FOR THAT YEAR.

CPUE IS BASED ON RETAINED + RELEASED FISH FOR 1992-96 AND ON RETAINED FISH ONLY PRIOR TO 1992.

* NOT ALLOWED TO RETAIN LARGE SALMON IN INSULAR NEWFOUNDLAND.

**DATA OBTAINED FROM THE LICENSE STUB RETURN (1999 DATA ARE PRELIMINARY).

Appendix 1i. Atlantic salmon recreational fishery catch and effort data for Salmon Fishing Area 6, insular Newfoundland, 1974-99. Ret. = retained fish; Rel. = released fish.

	Effort	Small (<63 cm)			Large (>= 63 cm)			Total (Small + Large)			
Year	Rod Days	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	CPUE
1974	2685	303	.	303	1	.	1	304	.	304	0.11
1975	1851	94	.	94	1	.	1	95	.	95	0.05
1976	2864	247	.	247	2	.	2	249	.	249	0.09
1977	1869	401	.	401	19	.	19	420	.	420	0.22
1978	2237	296	.	296	7	.	7	303	.	303	0.14
1979	1766	244	.	244	2	.	2	246	.	246	0.14
1980	2807	320	.	320	14	.	14	334	.	334	0.12
1981	3406	605	.	605	29	.	29	634	.	634	0.19
1982	3031	288	.	288	17	.	17	305	.	305	0.10
1983	3684	296	.	296	10	.	10	306	.	306	0.08
1984	3218	312	.	312	5	.	5	317	.	317	0.10
1985	2256	429	.	429	*	.	.	429	.	429	0.19
1986	2596	445	.	445	*	.	.	445	.	445	0.17
1987	1306	137	.	137	*	.	.	137	.	137	0.10
1988	3392	429	.	429	*	.	.	429	.	429	0.13
1989	2959	246	.	246	*	.	.	246	.	246	0.08
1990	3089	334	.	334	*	.	.	334	.	334	0.11
1991	1620	186	.	186	*	.	.	186	.	186	0.11
1992	2265	230	10	240	*	0	0	230	10	240	0.11
1993	2784	323	81	404	*	9	9	323	90	413	0.15
1994	2429	241	21	262	*	4	4	241	25	266	0.11
1995	2513	336	61	397	*	8	8	336	69	405	0.16
1996	2331	327	43	370	*	17	17	327	60	387	0.17
1997**		33	14	47	*	2	2	33	16	49	
1998**		71	42	113	*	4	4	71	46	117	
1999**		41	16	57	*	4	4	41	20	61	
84-89 $\bar{X}$	2884.2	372.2	.	372.2	.	.	.	373.2	.	373.2	0.13
95% CL	573.2	109.8	.	109.8	.	.	.	108.8	.	108.8	0.05
N	5	5	0	5	0	0	0	5	0	5	5
86-91 $\bar{X}$	2731.2	328.0	.	328.0	.	.	.	328.0	.	328.0	0.12
95% CL	848.8	139.9	.	139.9	.	.	.	139.9	.	139.9	0.04
N	5	5	0	5	0	0	0	5	0	5	5
92-96 $\bar{X}$	2464.4	291.4	43.2	334.6	0.0	7.6	7.6	291.4	50.8	342.2	0.14
95% CL	250.9	63.8	35.9	96.5	0.0	7.9	7.9	63.8	40.6	102.4	0.03
N	5	5	5	5	5	5	5	5	5	5	5

1987 DATA NOT INCLUDED IN MEAN.

IN THE ABOVE TABLE A PERIOD INDICATES NO DATA FOR THAT YEAR.

CPUE IS BASED ON RETAINED + RELEASED FISH FOR 1992-96 AND ON RETAINED FISH ONLY PRIOR TO 1992.

* NOT ALLOWED TO RETAIN LARGE SALMON IN INSULAR NEWFOUNDLAND.

**DATA OBTAINED FROM THE LICENSE STUB RETURN (1999 DATA ARE PRELIMINARY).

Appendix 1j. Atlantic salmon recreational fishery catch and effort data for Salmon Fishing Area 7, insular Newfoundland, 1974-99. Ret. = retained fish; Rel. = released fish.

	Effort	Small (<63 cm)			Large (>= 63 cm)			Total (Small + Large)			
Year	Rod Days	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	CPUE
1974	2019	133	.	133	2	.	2	135	.	135	0.07
1975	1436	40	.	40	0	.	0	40	.	40	0.03
1976	1128	30	.	30	0	.	0	30	.	30	0.03
1977	1775	78	.	78	1	.	1	79	.	79	0.04
1978	1786	99	.	99	1	.	1	100	.	100	0.06
1979	1332	125	.	125	0	.	0	125	.	125	0.09
1980	1546	102	.	102	1	.	1	103	.	103	0.07
1981	1348	123	.	123	2	.	2	125	.	125	0.09
1982	1621	155	.	155	10	.	10	165	.	165	0.10
1983	1804	139	.	139	34	.	34	173	.	173	0.10
1984	1381	96	.	96	4	.	4	100	.	100	0.07
1985	1635	112	.	112	*	.	.	112	.	112	0.07
1986	700	102	.	102	*	.	.	102	.	102	0.15
1987	632	28	.	28	*	.	.	28	.	28	0.04
1988	1645	128	.	128	*	.	.	128	.	128	0.08
1989	1226	66	.	66	*	.	.	66	.	66	0.05
1990	827	49	.	49	*	.	.	49	.	49	0.06
1991	644	36	.	36	*	.	.	36	.	36	0.06
1992	1313	40	0	40	*	0	0	40	0	40	0.03
1993	1107	58	3	61	*	0	0	58	3	61	0.06
1994	1162	71	0	71	*	0	0	71	0	71	0.06
1995	1425	170	0	170	*	0	0	170	0	170	0.12
1996	1603	139	3	142	*	0	0	139	3	142	0.09
1997**		9	0	9	*	3	3	9	3	12	
1998**		46	8	54	*	2	2	46	10	56	
1999**		8	2	10	*	0	0	8	2	10	
84-89 $\bar{X}$	1317.4	100.8	.	100.8	.	.	.	101.6	.	101.6	0.08
95% CL	481.5	28.5	.	28.5	.	.	.	28.3	.	28.3	0.03
N	5	5	0	5	0	0	0	5	0	5	5
86-91 $\bar{X}$	1008.4	76.2	.	76.2	.	.	.	76.2	.	76.2	0.08
95% CL	524.3	47.3	.	47.3	.	.	.	47.3	.	47.3	0.04
N	5	5	0	5	0	0	0	5	0	5	5
92-96 $\bar{X}$	1322.0	95.6	1.2	96.8	0.0	0.0	0.0	95.6	1.2	96.8	0.07
95% CL	249.4	69.5	2.0	69.6	0.0	0.0	0.0	69.5	2.0	69.6	0.04
N	5	5	5	5	5	5	5	5	5	5	5

1987 DATA NOT INCLUDED IN MEAN.

IN THE ABOVE TABLE A PERIOD INDICATES NO DATA FOR THAT YEAR.

CPUE IS BASED ON RETAINED + RELEASED FISH FOR 1992-96 AND ON RETAINED FISH ONLY PRIOR TO 1992.

* NOT ALLOWED TO RETAIN LARGE SALMON IN INSULAR NEWFOUNDLAND.

**DATA OBTAINED FROM THE LICENSE STUB RETURN (1999 DATA ARE PRELIMINARY).

Appendix 1k. Atlantic salmon recreational fishery catch and effort data for Salmon Fishing Area 8, insular Newfoundland, 1974-99. Ret. = retained fish; Rel. = released fish.

	Effort	Small (<63 cm)			Large (>= 63 cm)			Total (Small + Large)			
Year	Rod Days	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	CPUE
1974	659	51	.	51	0	.	0	51	.	51	0.08
1975	527	87	.	87	0	.	0	87	.	87	0.17
1976	514	80	.	80	0	.	0	80	.	80	0.16
1977	530	81	.	81	0	.	0	81	.	81	0.15
1978	269	44	.	44	0	.	0	44	.	44	0.16
1979	331	100	.	100	0	.	0	100	.	100	0.30
1980	316	120	.	120	0	.	0	120	.	120	0.38
1981	384	77	.	77	0	.	0	77	.	77	0.20
1982	538	85	.	85	9	.	9	94	.	94	0.17
1983	414	41	.	41	5	.	5	46	.	46	0.11
1984	357	79	.	79	0	.	0	79	.	79	0.22
1985	611	103	.	103	*	.	.	103	.	103	0.17
1986	696	138	.	138	*	.	.	138	.	138	0.20
1987	268	43	.	43	*	.	.	43	.	43	0.16
1988	474	79	.	79	*	.	.	79	.	79	0.17
1989	330	99	.	99	*	.	.	99	.	99	0.30
1990	349	86	.	86	*	.	.	86	.	86	0.25
1991	324	11	.	11	*	.	.	11	.	11	0.03
1992	.	.	.	.	*	.	.	.	.	.	.
1993	458	53	2	55	*	0	0	53	2	55	0.12
1994	265	57	1	58	*	0	0	57	1	58	0.22
1995	400	73	2	75	*	0	0	73	2	75	0.19
1996	518	59	0	59	*	0	0	59	0	59	0.11
1997**		9	5	14	*	0	0	9	5	14	
1998**		19	15	34	*	4	4	19	19	38	
1999**		15	58	73	*	2	2	15	60	75	
84-89 $\bar{X}$	493.6	99.6	.	99.6	.	.	.	99.6	.	99.6	0.20
95% CL	196.8	30.0	.	30.0	.	.	.	30.0	.	30.0	0.05
N	5	5	0	5	0	0	0	5	0	5	5
86-91 $\bar{X}$	434.6	82.6	.	82.6	.	.	.	82.6	.	82.6	0.19
95% CL	196.7	57.2	.	57.2	.	.	.	57.2	.	57.2	0.09
N	5	5	0	5	0	0	0	5	0	5	5
92-96 $\bar{X}$	410.3	60.5	1.3	61.8	0.0	0.0	0.0	60.5	1.3	61.8	0.15
95% CL	172.1	13.8	1.5	14.3	0.0	0.0	0.0	13.8	1.5	14.3	0.07
N	4	4	4	4	4	4	4	4	4	4	4

1987 DATA NOT INCLUDED IN MEAN.

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CPUE IS BASED ON RETAINED + RELEASED FISH FOR 1992-96 AND ON RETAINED FISH ONLY PRIOR TO 1992.

* NOT ALLOWED TO RETAIN LARGE SALMON IN INSULAR NEWFOUNDLAND.

**DATA OBTAINED FROM THE LICENSE STUB RETURN (1999 DATA ARE PRELIMINARY).

Appendix 11. Atlantic salmon recreational fishery catch and effort data for Salmon Fishing Area 9, insular Newfoundland, 1974-99. Ret. = retained fish; Rel. = released fish.

	Effort	Small (<63 cm)			Large (>= 63 cm)			Total (Small + Large)			
Year	Rod Days	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	CPUE
1974	9162	1494	.	1494	9	.	9	1503	.	1503	0.16
1975	10046	1872	.	1872	6	.	6	1878	.	1878	0.19
1976	8809	1623	.	1623	12	.	12	1635	.	1635	0.19
1977	8766	1080	.	1080	9	.	9	1089	.	1089	0.12
1978	7224	1303	.	1303	17	.	17	1320	.	1320	0.18
1979	5859	1704	.	1704	15	.	15	1719	.	1719	0.29
1980	6446	2379	.	2379	61	.	61	2440	.	2440	0.38
1981	6343	1862	.	1862	52	.	52	1914	.	1914	0.30
1982	8574	1825	.	1825	33	.	33	1858	.	1858	0.22
1983	10754	2303	.	2303	71	.	71	2374	.	2374	0.22
1984	8754	2264	.	2264	5	.	5	2269	.	2269	0.26
1985	9385	1750	.	1750	*	.	.	1750	.	1750	0.19
1986	8807	2298	.	2298	*	.	.	2298	.	2298	0.26
1987	5994	867	.	867	*	.	.	867	.	867	0.14
1988	7157	1373	.	1373	*	.	.	1373	.	1373	0.19
1989	7039	1315	.	1315	*	.	.	1315	.	1315	0.19
1990	8240	1866	.	1866	*	.	.	1866	.	1866	0.23
1991	6482	560	.	560	*	.	.	560	.	560	0.09
1992	6177	690	196	886	*	1	1	690	197	887	0.14
1993	10344	1431	151	1582	*	15	15	1431	166	1597	0.15
1994	7154	829	93	922	*	2	2	829	95	924	0.13
1995	10487	1594	307	1901	*	11	11	1594	318	1912	0.18
1996	10365	1371	251	1622	*	25	25	1371	276	1647	0.16
1997**		505	302	807	*	52	52	505	354	859	
1998**		551	419	970	*	112	112	551	531	1082	
1999**		354	149	503	*	57	57	354	206	560	
84-89 $\bar{X}$	8228.4	1800.0	.	1800.0	.	.	.	1801.0	.	1801.0	0.22
95% CL	1318.4	583.4	.	583.4	.	.	.	584.9	.	584.9	0.05
N	5	5	0	5	0	0	0	5	0	5	5
86-91 $\bar{X}$	7545.0	1482.4	.	1482.4	.	.	.	1482.4	.	1482.4	0.20
95% CL	1179.8	810.1	.	810.1	.	.	.	810.1	.	810.1	0.08
N	5	5	0	5	0	0	0	5	0	5	5
92-96 $\bar{X}$	8905.4	1183.0	199.6	1382.6	0.0	10.8	10.8	1183.0	210.4	1393.4	0.16
95% CL	2575.3	494.3	103.7	563.7	0.0	12.3	12.3	494.3	109.9	572.8	0.02
N	5	5	5	5	5	5	5	5	5	5	5

1987 DATA NOT INCLUDED IN MEAN.

IN THE ABOVE TABLE A PERIOD INDICATES NO DATA FOR THAT YEAR.

CPUE IS BASED ON RETAINED + RELEASED FISH FOR 1992-96 AND ON RETAINED FISH ONLY PRIOR TO 1992.

* NOT ALLOWED TO RETAIN LARGE SALMON IN INSULAR NEWFOUNDLAND.

**DATA OBTAINED FROM THE LICENSE STUB RETURN (1999 DATA ARE PRELIMINARY).

Appendix 1m. Atlantic salmon recreational fishery catch and effort data for Salmon Fishing Area 10, insular Newfoundland, 1974-99. Ret. = retained fish; Rel. = released fish.

	Effort	Small (<63 cm)			Large (>= 63 cm)			Total (Small + Large)			
Year	Rod Days	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	CPUE
1974	10987	1212	.	1212	14	.	14	1226	.	1226	0.11
1975	5999	427	.	427	9	.	9	436	.	436	0.07
1976	8811	730	.	730	10	.	10	740	.	740	0.08
1977	7213	1097	.	1097	5	.	5	1102	.	1102	0.15
1978	8764	1595	.	1595	42	.	42	1637	.	1637	0.19
1979	6405	849	.	849	8	.	8	857	.	857	0.13
1980	9588	1524	.	1524	27	.	27	1551	.	1551	0.16
1981	9309	1317	.	1317	29	.	29	1346	.	1346	0.14
1982	9331	1256	.	1256	10	.	10	1266	.	1266	0.14
1983	9173	1140	.	1140	79	.	79	1219	.	1219	0.13
1984	6361	1457	.	1457	2	.	2	1459	.	1459	0.23
1985	6887	1326	.	1326	*	.	.	1326	.	1326	0.19
1986	6387	1535	.	1535	*	.	.	1535	.	1535	0.24
1987	3348	429	.	429	*	.	.	429	.	429	0.13
1988	5198	1142	.	1142	*	.	.	1142	.	1142	0.22
1989	4709	898	.	898	*	.	.	898	.	898	0.19
1990	4778	835	.	835	*	.	.	835	.	835	0.17
1991	2960	230	.	230	*	.	.	230	.	230	0.08
1992	3422	245	497	742	*	6	6	245	503	748	0.22
1993	7656	700	691	1391	*	26	26	700	717	1417	0.19
1994	7028	946	150	1096	*	21	21	946	171	1117	0.16
1995	10210	1450	254	1704	*	23	23	1450	277	1727	0.17
1996	15128	2092	428	2520	*	88	88	2092	516	2608	0.17
1997**		705	391	1096	*	79	79	705	470	1175	
1998**		882	456	1338	*	98	98	882	554	1436	
1999**		471	318	789	*	124	124	471	442	913	
84-89 $\bar{X}$	5908.4	1271.6	.	1271.6	.	.	.	1272.0	.	1272.0	0.22
95% CL	1133.5	318.4	.	318.4	.	.	.	318.8	.	318.8	0.03
N	5	5	0	5	0	0	0	5	0	5	5
86-91 $\bar{X}$	4806.4	928.0	.	928.0	.	.	.	928.0	.	928.0	0.19
95% CL	1529.5	592.5	.	592.5	.	.	.	592.5	.	592.5	0.06
N	5	5	0	5	0	0	0	5	0	5	5
92-96 $\bar{X}$	8688.8	1086.6	404.0	1490.6	0.0	32.8	32.8	1086.6	436.8	1523.4	0.18
95% CL	5387.9	882.3	262.3	840.0	0.0	39.5	39.5	882.3	267.2	876.9	0.02
N	5	5	5	5	5	5	5	5	5	5	5

1987 DATA NOT INCLUDED IN MEAN.

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CPUE IS BASED ON RETAINED + RELEASED FISH FOR 1992-96 AND ON RETAINED FISH ONLY PRIOR TO 1992.

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**DATA OBTAINED FROM THE LICENSE STUB RETURN (1999 DATA ARE PRELIMINARY).

Appendix 1n. Atlantic salmon recreational fishery catch and effort data for Salmon Fishing Area 11, insular Newfoundland, 1974-99. Ret. = retained fish; Rel. = released fish.

	Effort	Small (<63 cm)			Large (>= 63 cm)			Total (Small + Large)			
Year	Rod Days	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	CPUE
1974	9119	4476	.	4476	38	.	38	4514	.	4514	0.50
1975	8473	4501	.	4501	40	.	40	4541	.	4541	0.54
1976	8681	4164	.	4164	42	.	42	4206	.	4206	0.48
1977	7966	4096	.	4096	18	.	18	4114	.	4114	0.52
1978	8050	3996	.	3996	18	.	18	4014	.	4014	0.50
1979	6570	3430	.	3430	7	.	7	3437	.	3437	0.52
1980	10010	5069	.	5069	44	.	44	5113	.	5113	0.51
1981	12836	7062	.	7062	41	.	41	7103	.	7103	0.55
1982	15334	7338	.	7338	53	.	53	7391	.	7391	0.48
1983	15419	4769	.	4769	27	.	27	4796	.	4796	0.31
1984	15385	7019	.	7019	15	.	15	7034	.	7034	0.46
1985	13712	5823	.	5823	*	.	.	5823	.	5823	0.42
1986	15233	5546	.	5546	*	.	.	5546	.	5546	0.36
1987	11309	3829	.	3829	*	.	.	3829	.	3829	0.34
1988	14811	5033	.	5033	*	.	.	5033	.	5033	0.34
1989	11543	2960	.	2960	*	.	.	2960	.	2960	0.26
1990	12520	4446	.	4446	*	.	.	4446	.	4446	0.36
1991	7647	1853	.	1853	*	.	.	1853	.	1853	0.24
1992	8501	2273	1039	3312	*	1	1	2273	1040	3313	0.39
1993	11280	3084	664	3748	*	43	43	3084	707	3791	0.34
1994	10891	2280	674	2954	*	38	38	2280	712	2992	0.27
1995	14449	3255	938	4193	*	13	13	3255	951	4206	0.29
1996	16135	4035	1746	5781	*	26	26	4035	1772	5807	0.36
1997**		2311	2039	4350	*	133	133	2311	2172	4483	
1998**		1130	1516	2646	*	109	109	1130	1625	2755	
1999**		994	1104	2098	*	62	62	994	1166	2160	
84-89 $\bar{X}$	14136.8	5276.2	.	5276.2	.	.	.	5279.2	.	5279.2	0.37
95% CL	1974.9	1844.8	.	1844.8	.	.	.	1850.3	.	1850.3	0.09
N	5	5	0	5	0	0	0	5	0	5	5
86-91 $\bar{X}$	12350.8	3967.6	.	3967.6	.	.	.	3967.6	.	3967.6	0.32
95% CL	3784.3	1897.3	.	1897.3	.	.	.	1897.3	.	1897.3	0.06
N	5	5	0	5	0	0	0	5	0	5	5
92-96 $\bar{X}$	12251.2	2985.4	1012.2	3997.6	0.0	24.2	24.2	2985.4	1036.4	4021.8	0.33
95% CL	3764.1	918.4	548.3	1365.6	0.0	21.6	21.6	918.4	541.9	1365.2	0.05
N	5	5	5	5	5	5	5	5	5	5	5

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CPUE IS BASED ON RETAINED + RELEASED FISH FOR 1992-96 AND ON RETAINED FISH ONLY PRIOR TO 1992.

* NOT ALLOWED TO RETAIN LARGE SALMON IN INSULAR NEWFOUNDLAND.

**DATA OBTAINED FROM THE LICENSE STUB RETURN (1999 DATA ARE PRELIMINARY).

Appendix 1o. Atlantic salmon recreational fishery catch and effort data for Salmon Fishing Area 12, insular Newfoundland, 1974-99. Ret. = retained fish; Rel. = released fish.

	Effort	Small (<63 cm)			Large (>= 63 cm)			Total (Small + Large)			
Year	Rod Days	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	CPUE
1974	1423	658	.	658	13	.	13	671	.	671	0.47
1975	1204	510	.	510	20	.	20	530	.	530	0.44
1976	926	297	.	297	5	.	5	302	.	302	0.33
1977	1238	558	.	558	48	.	48	606	.	606	0.49
1978	1305	366	.	366	20	.	20	386	.	386	0.30
1979	1711	733	.	733	10	.	10	743	.	743	0.43
1980	2175	820	.	820	29	.	29	849	.	849	0.39
1981	2035	1060	.	1060	17	.	17	1077	.	1077	0.53
1982	2810	1555	.	1555	15	.	15	1570	.	1570	0.56
1983	2648	667	.	667	8	.	8	675	.	675	0.25
1984	3590	1922	.	1922	68	.	68	1990	.	1990	0.55
1985	3722	1097	.	1097	*	30	30	1097	30	1127	0.30
1986	3430	938	.	938	*	34	34	938	34	972	0.28
1987	2212	831	.	831	*	27	27	831	27	858	0.39
1988	3607	1413	.	1413	*	23	23	1413	23	1436	0.40
1989	2657	560	.	560	*	10	10	560	10	570	0.21
1990	3060	856	.	856	*	30	30	856	30	886	0.29
1991	2761	644	.	644	*	15	15	644	15	659	0.24
1992	2831	639	466	1105	*	78	78	639	544	1183	0.42
1993	3362	745	155	900	*	22	22	745	177	922	0.27
1994	2853	593	137	730	*	48	48	593	185	778	0.27
1995	2679	507	87	594	*	41	41	507	128	635	0.24
1996***		716	282	998	*	53	53	716	335	1051	
1997**		634	468	1102	*	88	88	634	556	1190	
1998**		284	338	622	*	123	123	284	461	745	
1999**		112	91	203	*	26	26	112	117	229	
84-89 $\bar{X}$	3203.0	1126.8	.	1126.8	.	24.8	32.0	1138.2	24.8	1158.8	0.36
95% CL	649.4	505.5	.	505.5	.	11.4	20.4	529.3	11.4	522.9	0.13
N	6	6	0	6	0	5	6	6	5	6	6
86-91 $\bar{X}$	2954.5	873.7	.	873.7	.	23.2	23.2	873.7	23.2	896.8	0.30
95% CL	543.4	314.3	.	314.3	.	9.6	9.6	314.3	9.6	318.8	0.08
N	6	6	0	6	0	6	6	6	6	6	6
92-96 $\bar{X}$	2931.3	640.0	225.4	865.4	0.0	48.4	48.4	640.0	273.8	913.8	0.31
95% CL	473.2	118.9	189.3	254.6	0.0	25.2	25.2	118.9	210.7	268.8	0.12
N	4	5	5	5	0	5	5	5	5	5	4

IN THE ABOVE TABLE A PERIOD INDICATES NO DATA FOR THAT YEAR.
CPUE IS BASED ON RETAINED + RELEASED FISH FOR 1985-95 AND ON RETAINED FISH ONLY PRIOR TO 1985.
* NOT ALLOWED TO RETAIN LARGE SALMON IN INSULAR NEWFOUNDLAND.
**DATA OBTAINED FROM THE LICENSE STUB RETURN (1999 DATA ARE PRELIMINARY).
***FOR RIVERS WHERE DFO DATA WERE UNAVAILABLE, LICENSE STUB RETURN DATA WERE USED.

Appendix 1p. Atlantic salmon recreational fishery catch and effort data for Salmon Fishing Area 13, insular Newfoundland, 1974-99. Ret. = retained fish; Rel. = released fish.

	Effort	Small (<63 cm)			Large (>= 63 cm)			Total (Small + Large)			
Year	Rod Days	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	CPUE
1974	29313	7189	.	7189	916	.	916	8105	.	8105	0.28
1975	32253	12003	.	12003	886	.	886	12889	.	12889	0.40
1976	32922	10383	.	10383	626	.	626	11009	.	11009	0.33
1977	24474	6712	.	6712	1049	.	1049	7761	.	7761	0.32
1978	19686	5289	.	5289	855	.	855	6144	.	6144	0.31
1979	16383	6009	.	6009	113	.	113	6122	.	6122	0.37
1980	21313	7913	.	7913	993	.	993	8906	.	8906	0.42
1981	23839	9300	.	9300	663	.	663	9963	.	9963	0.42
1982	25246	9566	.	9566	595	.	595	10161	.	10161	0.40
1983	25473	6337	.	6337	610	.	610	6947	.	6947	0.27
1984	22152	7771	.	7771	309	.	309	8080	.	8080	0.36
1985	20137	5302	.	5302	*	257	257	5302	257	5559	0.28
1986	25707	7346	.	7346	*	662	662	7346	662	8008	0.31
1987	20887	6018	.	6018	*	342	342	6018	342	6360	0.30
1988	24356	8217	.	8217	*	406	406	8217	406	8623	0.35
1989	18544	3174	.	3174	*	129	129	3174	129	3303	0.18
1990	21769	6652	.	6652	*	337	337	6652	337	6989	0.32
1991	21028	5188	.	5188	*	204	204	5188	204	5392	0.26
1992	21629	5430	540	5970	*	947	947	5430	1487	6917	0.32
1993	22521	5099	829	5928	*	732	732	5099	1561	6660	0.30
1994	19723	3632	936	4568	*	929	929	3632	1865	5497	0.28
1995	18107	3336	1164	4500	*	948	948	3336	2112	5448	0.30
1996***		4461	4644	9105	*	1236	1236	4461	5880	10341	
1997**		3785	6263	10048	*	2042	2042	3785	8305	12090	
1998**		2434	4061	6495	*	1679	1679	2434	5740	8174	
1999**		2954	2175	5129	*	1254	1254	2954	3429	6383	
84-89 $\bar{X}$	21963.8	6304.7	.	6304.7	.	359.2	350.8	6356.2	359.2	6655.5	0.30
95% CL	2814.9	1979.3	.	1979.3	.	246.4	187.6	2033.4	246.4	2112.7	0.06
N	6	6	0	6	0	5	6	6	5	6	6
86-91 $\bar{X}$	22048.5	6099.2	.	6099.2	.	346.7	346.7	6099.2	346.7	6445.8	0.29
95% CL	2715.2	1862.2	.	1862.2	.	194.0	194.0	1862.2	194.0	2017.4	0.06
N	6	6	0	6	0	6	6	6	6	6	6
92-96 $\bar{X}$	20495.0	4391.6	1622.6	6014.2	0.0	958.4	958.4	4391.6	2581.0	6972.6	0.34
95% CL	3140.5	1123.3	2115.3	2318.1	0.0	223.3	223.3	1123.3	2310.4	2478.9	0.08
N	4	5	5	5	0	5	5	5	5	5	4

IN THE ABOVE TABLE A PERIOD INDICATES NO DATA FOR THAT YEAR.

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***FOR RIVERS WHERE DFO DATA WERE UNAVAILABLE, LICENSE STUB RETURN DATA WERE USED.

Appendix 1q. Atlantic salmon recreational fishery catch and effort data for Salmon Fishing Area 14A, insular Newfoundland, 1974-99. Ret. = retained fish; Rel. = released fish.

	Effort	Small (<63 cm)			Large (>= 63 cm)			Total (Small + Large)			
Year	Rod Days	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	CPUE
1974	9569	3120	.	3120	113	.	113	3233	.	3233	0.34
1975	9259	4818	.	4818	90	.	90	4908	.	4908	0.53
1976	17146	7381	.	7381	100	.	100	7481	.	7481	0.44
1977	17067	5707	.	5707	472	.	472	6179	.	6179	0.36
1978	12069	3241	.	3241	72	.	72	3313	.	3313	0.27
1979	14285	6578	.	6578	59	.	59	6637	.	6637	0.46
1980	14219	3743	.	3743	180	.	180	3923	.	3923	0.28
1981	18718	5882	.	5882	137	.	137	6019	.	6019	0.32
1982	16113	4763	.	4763	107	.	107	4870	.	4870	0.30
1983	16020	3800	.	3800	69	.	69	3869	.	3869	0.24
1984	16497	4807	.	4807	87	.	87	4894	.	4894	0.30
1985	13388	3626	.	3626	*	28	28	3626	28	3654	0.27
1986	15382	5030	.	5030	*	102	102	5030	102	5132	0.33
1987	15061	4620	.	4620	*	41	41	4620	41	4661	0.31
1988	18968	6251	.	6251	*	171	171	6251	171	6422	0.34
1989	16223	3203	.	3203	*	44	44	3203	44	3247	0.20
1990	16413	5050	.	5050	*	136	136	5050	136	5186	0.32
1991	13850	3565	.	3565	*	117	117	3565	117	3682	0.27
1992	17117	4778	531	5309	*	369	369	4778	900	5678	0.33
1993	17858	3905	2002	5907	*	376	376	3905	2378	6283	0.35
1994	21046	4429	1097	5526	*	475	475	4429	1572	6001	0.29
1995	24159	6090	2087	8177	*	731	731	6090	2818	8908	0.37
1996	25876	6485	3008	9493	*	706	706	6485	3714	10199	0.39
1997**		3514	1822	5336	*	417	417	3514	2239	5753	
1998**		3608	3473	7081	*	469	469	3608	3942	7550	
1999**		2463	1472	3935	*	586	586	2463	2058	4521	
84-89 $\bar{X}$	15919.8	4589.5	.	4589.5	.	77.2	78.8	4604.0	77.2	4668.3	0.29
95% CL	1944.1	1135.7	.	1135.7	.	74.1	56.2	1139.9	74.1	1186.6	0.06
N	6	6	0	6	0	5	6	6	5	6	6
86-91 $\bar{X}$	15982.8	4619.8	.	4619.8	.	101.8	101.8	4619.8	101.8	4721.7	0.30
95% CL	1812.7	1162.6	.	1162.6	.	54.0	54.0	1162.6	54.0	1199.9	0.06
N	6	6	0	6	0	6	6	6	6	6	6
92-96 $\bar{X}$	21211.2	5137.4	1745.0	6882.4	0.0	531.4	531.4	5137.4	2276.4	7413.8	0.35
95% CL	4747.0	1370.3	1189.5	2302.4	0.0	218.6	218.6	1370.3	1354.4	2504.4	0.05
N	5	5	5	5	5	5	5	5	5	5	5

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